

USE OF EVIDENCE-BASED PRACTICE BY OUTPATIENT  
ONCOLOGY NURSES IN THE MANAGEMENT OF  
CANCER-RELATED PAIN AND FATIGUE

by

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## ABSTRACT

Previous studies of cancer-related pain and fatigue guidelines adoption by nurses demonstrated low adoption. The purposes of this study was to follow-up and determine current levels of adoption for pain/fatigue guidelines by outpatient oncology nurses, determine factors that affect adoption, compare results to previous studies, and evaluate effect of survey mode on estimates of adoption rates. A correlational descriptive survey research design was guided by Rogers' Diffusion of Innovation model. Direct care outpatient nurse members of the Oncology Nursing Society ( $n=8100$ ) were invited to participate in a Web survey ( $n=8000$ ) or a mailed survey ( $n=100$ ). The overall response rate was 7% with 563 useable surveys. Response was 18% ( $n=18$ ) for mail and 7% ( $n=545$ ) for Web surveys. Cost per useable survey was \$20.51 for Web and \$75.66 for mail surveys. Mann-Whitney  $U$  tests found no differences in guideline adoption by survey mode for pain ( $p=.450$ ) and fatigue ( $p=.660$ ). Measures included: Oncology Nursing Practice Questionnaire (ONPQ), Research Utilization in Nursing (RU-N), and Perceived Characteristics of Innovating (PCI). Pain guidelines and individual pain practices adoption levels were categorized as *use sometimes*. Fatigue guidelines adoption was categorized as *awareness*, but individual fatigue practices was categorized as *use sometimes*. Mann Whitney  $U$  tests indicated guidelines adoption for advanced practice nurses was greater

than staff nurses for pain ( $p<.001$ ) and fatigue ( $p<.001$ ). Multiple regression found opinion leadership, experience, education, climate for change, context, policies, and perceptions accounted for 21.4% of variance in pain adoption ( $R^2=.23$ ,  $F(7,500)=20.77$ ,  $p<.001$ ). Cosmopolitaness, experience, education, climate for change, policies, and perceptions accounted for 21.1% of variance in fatigue adoption ( $R^2=.22$ ,  $F(6,495)=23.33$ ,  $p<.001$ ). Compared to previous studies, pain guideline scores have improved ( $M=1.3$ ,  $SD=1.5$ ),  $t(519)=8.43$ ,  $p<.001$ , but pain/fatigue practices remain at *use sometimes*. Adequate instrument reliabilities were obtained for RU-N ( $\alpha = .67$  to  $.91$ ), ONPQ ( $\alpha = .68$  to  $.75$ ), and PCI ( $\alpha = .85$  to  $.94$ ). The RU-N, ONPQ, and PCI can be successfully converted to Web surveys, cost less, but lower response. Results indicate that pain/fatigue guidelines adoption has not substantially improved, suggesting current strategies to encourage adoption are ineffective and require new approaches.

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## CHAPTER 1

### INTRODUCTION

#### Problem Statement

Using research to make appropriate healthcare practice decisions has been a part of nursing since its earliest pioneers, as is evident with Florence Nightingale's use of mortality data to improve the healthcare outcomes of militia in the Crimea (McDonald, 2001). The use of the best available evidence to determine treatment decisions has the potential to improve patient care and outcomes by promoting evidence-based care while discouraging ineffective care.

Evidence-based practice is a process of using research results to determine management of healthcare problems. The product of the evidence-based practice process is evidence-based recommendations or clinical practice guidelines. Clinical practice guidelines are widely available to support management of a variety of healthcare problems. However, this evidence is often not incorporated into practice. Solitary strategies to promote adoption of research findings, such as dissemination and education, have been unsuccessful in promoting change (Freemantle et al., 2005; Grimshaw et al., 2001).

Problems in adoption of clinical practice guidelines have been well described in the literature for physicians, nurses, and other health practitioners.

The President's Cancer Panel report of 2004-2005 confirmed that widespread use of guidelines had not occurred (Reuben, 2005). Research is needed to determine ways to encourage widespread adoption of guidelines. A baseline measure of current knowledge and use of guidelines is necessary in order to develop strategies to encourage widespread adoption. Use of a World Wide Web survey would greatly increase the number of potential participants for this survey. However, validated instruments using Web survey methodology are limited in availability. When the reliability and validity of the instruments have been determined with a different mode of survey administration, consideration must be given as to how changing the mode may have changed the reliability.

This study was conducted to assess adoption of clinical practice guidelines and specific recommendations by oncology nurses for management of symptoms related to cancer and its treatment. The setting for cancer treatment has shifted from primarily inpatient to outpatient (Williamson, 2008). For this reason, the sample for this study was oncology nurses in the outpatient setting. In addition, equivalency of the Web survey and the paper survey methodologies were assessed. In order to know how to promote use of the pain and fatigue guidelines and improve patient care, it was essential to know the current levels of adoption.

### Purpose and Specific Aims

The purpose of this study was three-fold. The first was to determine the current level of adoption of clinical practice guidelines and specific recommended practices to manage cancer-related pain and fatigue and to determine if this is

different from previous research. The next purpose was to determine which nurse and organization factors influenced pain and fatigue guideline adoption. The final purpose was to evaluate the effect of survey mode of administration on survey results.

### Aim 1

To determine the level of adoption of clinical practice guidelines for cancer-related pain and fatigue by outpatient oncology nurses.

RQ1.1: What are the levels of adoption by outpatient oncology nurses of clinical practice guidelines for management of pain and for management of fatigue?

RQ1.2: What are the levels of adoption by outpatient oncology nurses of three specific recommended practices for management of pain and three specific recommended practices for management of fatigue?

RQ1.3: Has outpatient oncology nurse adoption of management guidelines and specific practices for pain and fatigue changed compared to earlier research findings reported by Greene (1997) and Rutledge, Greene, Mooney, Nail, and Ropka (1996)?

RQ1.4: Do nurse characteristics, organizational characteristics, and nurse perception of using the guidelines influence outpatient oncology nurses' adoption of pain and fatigue guidelines?

## Aim 2

To compare Web survey method of delivery and mail survey method of delivery.

RQ2: Is Web survey method of delivery equivalent to mail survey method of delivery for response, cost, total scores on all measures, and demographic descriptors of respondents?

## Review of the Literature

### Evidence

Evidence is the end product of research studies. Research utilization (RU), evidence-based medicine (EBM), and evidence-based practice (EBP) are all processes that use evidence to answer clinical questions. RU is the most limited of these processes with the use of statistical research to guide healthcare practices and excluding nonresearch evidence such as consensus statements, expert opinions, and clinical experience (Kirchhoff, 2004). EBM and EBP are dynamic processes that allow these additional types of evidence. EBP is a complex nonlinear process that is the most global of these processes with the additional inclusion of patient preferences.

Systematic efforts to use research known as RU began in the 1970s (Kirchhoff, 2004). EBM emerged from an approach to continuing medical education under the name of Clinical Epidemiology (CE) (Sackett, Haines, & Tugwell, 1985). Advocates of CE pushed for individual physician utilization of research, or statistically proven research for use in clinical practice (Charlton & Miles, 1998). Clinical decision-making traditionally had been based on clinical

expertise prior to this initiative. Clinical expertise is the skill and judgment that clinicians gain with clinical experience and clinical practice (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). The term EBM, first noted in a publication in 1991 (Guyatt, 1991), marked a shift in the approach to medical decision-making from a decision made primarily out of clinical expertise to a decision made as a result of current statistically proven research.

Models of the EBP process that have been published include: Promoting Action on Research Implementation in Health Services (Kitson, Harvey, & McCormack, 1998), the Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001), the Ottawa Model of Research Use (Logan & Graham, 1998), and the ACE Star model (Stevens, 2006). Steps common to these models identified by Bliss-Holtz (2007) include: formulation of a question of some uncertainty, performance of a literature search to collect the most relevant evidence, critical evaluation of this evidence with regards to validity and reliability, development of guidelines, and integration into practice with evaluation of the outcome. A particular type of research devoted to the use of the evidence obtained from this process is translational research.

Translational research is a process where ideas and innovations, created through basic scientific research and clinical practice, are translated into efficient clinically relevant material in an effort to reduce patient morbidity and mortality (Berger & Mitchell, 2009). This translation process exists on a continuum consisting of five steps: basic science discovery, early translation, late



translation, dissemination, and adoption. Basic science and adoption of research findings are located at opposite extremes of the translation continuum.

Evidence obtained from basic science discovery is translated into interventions supported by clinical trials in the translation process. These interventions are used to develop standards of care known as clinical practice guidelines. Guidelines to help manage healthcare and prevent complications associated with cancer and cancer treatment have been published and are available through various oncology specialty organizations. These organizations have disseminated this information by various methods, including email, conventional mass mailings, and conference presentations.

### Levels of Evidence

Professional organizations and regulatory bodies have established levels of evidence as a grading system to assist with determination of the strength of the evidence according to the scientific rigor involved in development of the evidence. Hierarchical ranking systems as a method for evaluating sources of evidence are utilized by organizations such as the American Society of Clinical Oncology (ASCO) and the Oncology Nursing Society (ONS). ASCO created five categories arranged from the strongest to the weakest evidence. The first and strongest level of evidence includes meta-analysis of multiple, well-designed, controlled studies, including randomized trials with high power. The second level of evidence includes at least one well-designed experimental study, and can contain studies with low power. The third level of evidence consists of quasi-experimental studies. The fourth level of evidence includes well-designed, non-

experimental studies. The fifth level of evidence consists of case reports and clinical examples.

An ONS project team used Hadorn, Baker, Hodges, and Hicks (1996) as a model and developed a method for evaluating sources of evidence. Level one evidence is considered the strongest evidence and has three subcategories: (a) meta-analysis or systematic reviews of multiple well designed, randomized, controlled clinical trials; (b) well-controlled, randomized clinical trials with adequate sample size; and (c) well-designed trials without randomization. Level two evidence is strong with four subcategories: (a) systematic review of non-experimental design studies; (b) well-conducted case-control studies; (c) poorly controlled randomized or correlational descriptive studies; and (d) conflicting evidence or meta-analysis without significance, National Institutes of Health Consensus Reports, and published guidelines. Level three evidence is non-research-based evidence (case studies or expert opinions).

### Knowledge of Evidence

Research has found a large variation in nurses' knowledge of the evidence regardless of the subject being investigated. The percentage of nurses who had knowledge of specific guideline recommendations ranged from 32% (McGuire, Johnson, & Migliorati, 2006) to 88.4% (Mahon, Williams, & Spies, 2000). Nurses responded correctly to only 50-60% of the questions about second malignancies and osteoporosis risk included in the American Cancer Society guidelines, although 88.4% of these nurses considered themselves experts (Mahon et al., 2000). Two-thirds (62%, 66%, and 68%) of U.S. respondents

attending cancer conferences were not aware of the 2004 Multinational Association for Supportive Care in Cancer/International Society of Oral Oncology mucositis guidelines (McGuire et al., 2006).

Nurses in the hospice setting were more knowledgeable than hospital nurses about pain management guidelines (Hollen, Hollen, & Stolte, 2000). Hospice nurses scored 67% on the Nurses' Knowledge and Attitudes Survey Regarding Pain in relation to the National Comprehensive Cancer Network (NCCN) pain management guidelines prior to a feedback and pain rounds intervention to increase knowledge, and, although there was a significant increase following the intervention, their knowledge level only increased to 80% (Idell, Grant, & Kirk, 2007). Ayello, Baranoski, and Salati (2005) evaluated nurse knowledge of clinical practice guidelines in the prevention and care of wounds and found that knowledge increased with the age, the expertise, and the experience of the nurse.

#### Use of Evidence in Oncology Nursing

Cancer nursing practices assessed for guideline use and found to have little improvement over time included those related to chemotherapy handling practices (Martin & Larson, 2003), mucositis (McGuire et al., 2006), nausea/vomiting (Chung et al., 2011; Jordan, Sippel, & Schmoll, 2007), secondary cancers (Mahon et al., 2000), wound care (Ayello et al., 2005), pain (Cunningham, 2006; Greene, 1997; Hollen et al., 2000; Idell et al., 2007; McGuire et al., 2006; Rutledge et al., 1996; Wells, McDowell, & Hendricks, 2007), and fatigue (Borneman et al., 2007; Nail, 2002; Rutledge et al., 1996;

Stone et al., 2000). Cancer symptom clinical practice guidelines with a history of development and dissemination include guidelines for pain and fatigue (Aiello-Laws et al., 2009; American Academy of Hospice and Palliative Medicine, 2007; American Academy of Pain Medicine, 1998; American Pain Society Quality of Care Committee, 1995; American Society of Anesthesiologists, 1996; Gordon et al., 2005; Jacox, Carr, & Payne, 1994; Mitchell, Beck, Hood, Moore, & Tanner, 2007; Mock, 2001; Mock et al., 2000; National Comprehensive Cancer Network [NCCN], 2009; NCCN, 2011; Oncology Nursing Society, 2006; Oncology Nursing Society, 2008; World Health Organization, 1986).

### Cancer-Related Pain

Cancer-related pain is acute, chronic, or intermittent pain related to cancer or its treatment (Oncology Nursing Society, 2008). Pain is experienced by 14-100% of cancer patients (McGuire, 2004). Pain affects cancer patients not only physically, but also emotionally, with negative influences on quality of life, recovery time, and functional status, thus limiting roles at home and at work (Innis, Bikaunieks, Petryshen, Zellermyer, & Ciccarelli, 2004; Jacox et al., 1994; Oliver, Kravitz, Kaplan, & Meyers, 2001; Sherwood, Adams-McNeill, Starck, Nieto, & Thompson, 2000). Not all cancer pain can be eliminated, but when the best available evidence is applied, effective relief can be achieved for most patients (NCCN, 2011).

Cancer pain guidelines comprised of the best available research on effective pain management strategies have been established and disseminated to health care providers. Numerous pain guidelines have been created on both

the national and international level (American Academy of Hospice and Palliative Medicine, 2007; American Geriatric Society, 2009; American Society of Anesthesiologists, 1996; Benedetti et al., 2000; Gordon et al., 2005; Herr et al., 2002; Jacox et al., 1994; Miaskowski et al., 2005; National Comprehensive Cancer Network, 2011; Oncology Nursing Society, 2008; World Health Organization, 1986). The World Health Organization (WHO) recognized that the proximity of nurses to patients and their families enables them to provide constant emotional, spiritual, and personal support, giving credence to their role in assessing and monitoring pain and other symptoms. WHO determined that there was an urgent need for updated pain management guidelines that would gain broad support worldwide (World Health Organization, 2007). The Agency for Health Care Policy and Research (AHCPR) is a national guideline clearinghouse that has published pain management guidelines since 1994 (Jacox et al., 1994). AHCPR is now known as the Agency for Healthcare Research and Quality (AHRQ). The Oncology Nursing Society (ONS), the American Pain Society (APS), and the National Comprehensive Cancer Network (NCCN) have developed pain management guidelines that contain recommendations falling within the scope of nursing practice.

The top three legislative priorities identified by members of the ONS included the guarantee of access to pain control and symptom management from diagnosis through the end of life (Murphy et al., 2005). The ONS (2006) published a position statement on cancer pain management in 1998 that was last revised in 2006. The ONS position is that all people with cancer have a right to

optimal pain relief, including pain education, assessment, and management. However, recent studies have reported a lack of use of pain management guidelines by nurses (Wells et al., 2007).

In 2005, the APS recommended universal screening of cancer patients for pain using a valid scale. The APS recommendations were that a positive report of pain would lead to assessment with a detailed pain history, psychological assessment, physical and neurological examination, and diagnostic evaluation for commonly associated signs and symptoms. Treatment was to be both pharmacologic and nonpharmacologic. Chronic cancer pain would be treated in a proactive way using both scheduled (around-the-clock) and as-needed analgesics. Nonpharmacologic interventions of patient education about causes of their pain, and the types and rationale for analgesic medication with specific instructions on dosing and side effect management are to be included. Other nonpharmacologic strategies include hypnosis, breathing exercises, imagery, cognitive-behavioral methods, and supportive therapy. Physical strategies consist of heat and cold application, massage, exercise, and transcutaneous electrical nerve stimulation (TENS). Consistent with evidence-based practice, the APS updated these guidelines to include involvement of providers, patients, and health care organizations in the pain management plan.

The NCCN (2011) recommended universal pain screening of all cancer patients with intensity quantified and pain characteristics identified. The NCCN guideline recommendations include a comprehensive pain assessment to identify pain etiology, pathophysiology, or a specific pain syndrome. The NCCN

recommends that pain medication be given on a regular schedule for continuous pain, with supplemental medication for breakthrough pain. Severe and uncontrolled pain is considered a medical emergency that requires prompt medical evaluation for possible bone fracture, spinal cord compression, and/or epidural metastases.

Using a pain scale with a range of 1 to 10, with 1 being the mildest and 10 being the worst pain, the NCCN (2011) ranks pain as mild (1-3), moderate (4-6), or severe (7-10). All levels of pain have pharmacologic recommendations with use of nonpharmacologic recommendations to optimize effect. These non-pharmacologic treatments include: physical modalities (bed, bath, walking supports, positioning, physical therapy, massage, heat/ice, TENS, acupuncture or acupressure, and ultrasonic stimulation) and cognitive modalities (imagery/hypnosis, distraction training, relaxation, coping training, prioritizing, cognitive behavioral training, and spiritual care).

A comparison of the APS (Gordon et al., 2005), the ONS (2008), and the NCCN (2011) cancer-related pain management guidelines revealed common pain quality indicators. The following were identified as three quality indicators for pain that are within the scope of nursing and used in this study: systematic pain assessment, scheduled pain medications, and nonpharmacologic techniques for pain management. Greene (1997) and Rutledge et al. (1996) investigated similar pain quality indicators.

Greene (1997) described national oncology office nurses' level of adoption of the AHCPR clinical practice guideline for cancer pain management using

Rogers' (1995) theory of diffusion of innovations. She analyzed relationships among the level of adoption, perceived barriers, and factors that limited potential for making change. Greene's study found a low level of adoption of the AHCPR pain guidelines. Greene also evaluated the nurse adoption of the following specific practices recommended in the guidelines: systematic pain assessment, scheduled medication, and nonpharmacologic techniques for pain management. She found that the nurses were aware of but not using these practices, and that nurses with multiple sources of information for clinical problem solving were more likely to have adopted them.

Rutledge et al. (1996) conducted a national survey using the Oncology Nursing Practice Questionnaire (ONPQ) to examine the extent to which oncology nurses had adopted eight evidence-based practices. Included in the practices evaluated were the use of systematic assessments of pain and nonpharmacologic pain management techniques. The researchers found that outpatient nurses sometimes used systematic pain assessment and nonpharmacologic pain techniques.

### Cancer-Related Fatigue

Cancer-related fatigue is a feeling of tiredness that is persistent and interferes with functioning (NCCN, 2009). Fatigue is more than diminished energy that is unrelieved by sleep; it can also be generalized weakness, lack of concentration and/or motivation, emotional lability, all of which are not due to comorbid conditions other than cancer (Mitchell, Beck, & Eaton, 2009). Fatigue affects 70% to 100% of cancer patients (Hofman, Ruan, Fiogueroa-Moseley,



Jean-Pierre, & Morrow, 2007). Uncontrolled fatigue has negative influences on quality of life and functional status (Curt, 2000; Given et al., 2002; Grant, Golant, Rivera, Dean, & Benjamin, 2000). Cancer patients identify fatigue as the most upsetting symptom of their diagnosis, exceeding pain or nausea (Vogelzang, Breitbart, & Portenoy, 1997), yet Stone et al. (2000) found that only 14% of the patients that had experienced fatigue had received any treatment or suggestions for fatigue management. Rutledge et al. (1996) found that outpatient oncology nurses sometimes used the practice of systematic fatigue assessment.

The ONS held a consensus conference on cancer-related fatigue more than 14 years ago (Winningham et al., 1994). Consideration of fatigue as a significant problem for cancer patients has continued since that time. In 2005 the ONS published recommendations for management of fatigue (Mitchell et al., 2007), and established clinical practice guidelines for fatigue management with the ONS Fatigue Putting Evidence into Practice (PEP). The ONS PEP includes the following recommendations for fatigue: exercise, energy conservation, education, sleep quality, relaxation, massage, and healing touch.

The NCCN published their first fatigue guideline in 2000 (Mock et al., 2000). This has been updated periodically. The NCCN 2009 recommendations included screening every patient for fatigue as a vital sign at regular intervals. Recommendations for interventions with fatigue included energy conservation and use of distraction (games, music, reading, socializing, etc.), non-pharmacologic interventions such as activity enhancement (exercise and physical/occupational therapy), psychosocial interventions (cognitive and

behavioral, stress management, relaxation, and support groups) and sleep therapy, and pharmacologic interventions (NCCN, 2009).

Nail (2002) found that although healthcare provider knowledge of fatigue in cancer patients has increased, fatigue continues to be poorly understood and fails to be routinely assessed. Consistent with the findings from Rutledge et al. (1996) more than a decade earlier, the results of the prospective translational interventional study of Borneman et al. (2007) to implement fatigue guidelines were that at baseline, only 23% of health care providers routinely assessed for fatigue. Fatigue is recognized as a significant problem with oncology patients, yet continues to be inadequately managed.

Comparison of the ONS (Mitchell et al., 2007) and the NCCN (2009) cancer-related fatigue management guidelines yielded common recommendations that fit into the nursing scope of practice for both the registered nurse and the advanced practice nurse. The following were identified as three quality indicators for fatigue used in the current study: systematic fatigue assessment, exercise for fatigue, and use of nonpharmacologic techniques for fatigue management.

#### Methodological Issues of Survey Delivery

If reliability of a questionnaire has been obtained with a mail survey format, an investigator can feel comfortable that the survey will probably be reliable when used again in this same format. With the multiple ways currently available to conduct surveys (face-to-face, telephone, mail, email, and Web), if reliability and validity have been obtained with one mode of survey

administration, consideration must be given as to how changing the mode may change the reliability. Internet surveys are relatively new and questionnaires previously shown to have adequate reliability in a paper and pencil or telephone format may not be reliable when the questionnaire is converted to a Web format.

Riva, Teruzzi, and Anolli (2003) compared Web survey assessment techniques with paper survey assessment techniques to measure Internet attitudes and behaviors looking at differences between the psychometric characteristics of the Computer Use Survey and the Internet Attitudes Survey. Cronbach's alpha was used to determine the level of internal consistency of the two questionnaires. The researchers found that both the Web and paper survey modes of administration led to adequate reliability for the Computer Use Survey with the Web ( $\alpha = .75$ ) compared to the paper survey ( $\alpha = .84$ ), and for the Internet Attitudes Survey with the Web ( $\alpha = .74$ ) compared to the paper survey ( $\alpha = .84$ ).

Graham et al. (2006) examined the reliability of questionnaires commonly used for smoking cessation clinical trials administered over the Internet compared to telephone administered questionnaires. Internal consistency reliability, as measured by Cronbach's alpha, was equivalent for the Internet compared to the telephone survey modes for previous smoking cessation methods for most scales: Perceived Stress Scale ( $\alpha = .78$  vs.  $.72$ ), Centers for Epidemiological Studies – Depression Scale ( $\alpha = .85$  vs.  $.80$ ), Partner Interaction Questionnaire ( $\alpha = .78$  vs.  $.75$ ), and Smoking Temptations Questionnaire ( $\alpha = .70$  vs.  $.63$ ). No studies have compared the mail survey version and the Web survey

version of the ONPQ (Rutledge et al., 1996), the RU-N (Greene, 1997), or the PCI (Moore & Benbasat, 1991).

The traditional mail format of the ONPQ, RU-N, and PCI were converted to a Web format for the current study. Design principles created by Dillman (2007) for a paper questionnaire to decrease nonresponse, item omissions, measurement error, and to positively influence overall survey success were used for survey development. Dillman points out that the survey designer's intended meaning with the construction, distribution, and receipt of the questionnaire is mediated through the participant's computer setup (hardware, software, and preferences); the computer screen as viewed by the designer could be unlike the view seen by the participant. Dillman provided distinctive design considerations for the Web as the survey mode with the Tailored Design (TD) principles. Use of these principles should minimize error, thus increasing the quality of the questionnaire. The format of the Web survey was constructed to resemble the mail questionnaire as closely as possible while adhering to Dillman's recommendations.

### Theoretical Framework

The majority of researchers evaluating elements of clinical practice guidelines in nursing have not used a theoretical framework to guide their research. Theories that were found that guided research related to clinical practice guidelines in nursing were diverse and included: theory of planned behavior (Aragon, Sole, & Brown, 2005), construct of EBM – Sacket (Bogdan-Lovis & Souza, 2005), Donabedian (Cunningham, 2006), informatics

infrastructure for evidence-based practice (Dykes et al., 2005), and grounded theory method (Hysong, Best, & Pugh, 2006). Other theories used to study use of clinical practice guidelines included: Pathman and colleagues' awareness to adherence model (Levac, 2002), Kitson and colleagues' (1998) promoting action on research implementation in health services framework (Donaldson, Rutledge, & Jeffrey, 2004), and Rogers' theory of diffusion of innovations (Greene, 1997; Lia-Hoagberg, Schaffer, & Strohschein, 1999; Olade, 2004; Rutledge et al., 1996).

Rogers (1995) describes innovation as an idea, practice, or object that is perceived as new by an individual or unit; it can be knowledge that is known but not adopted, and not necessarily new. A clinical practice guideline is an example of an innovation. Rogers' diffusion of innovations theory is a useful theoretical framework to guide the evaluative work of clinical practice guideline dissemination as it addresses many of the complex factors relevant to knowledge acquisition and utilization in practice.

#### E. M. Rogers' (1995) Diffusion of Innovations

Everett M. Rogers (1995) first described a general diffusion model to generate greater consciousness across research disciplines with the 1962 publication of *Diffusion of Innovations*. He developed a combination of basic principles of effective factors for promotion of dissemination and utilization of knowledge in the diffusion of innovation theory. Major research traditions that have published diffusion research include: anthropology, sociology, education, public health, and medical sociology, communication, marketing, and

management, and geography (Rogers, 2003). Diffusion is “the process by which an innovation is communicated through certain channels over time to members of a social system” (Rogers, 1995, p. 5). Innovativeness is “the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system” (Rogers, 1995, p. 22).

Rogers (1995) identifies five categories of innovativeness determined by the speed of adoption: innovators, early adopters, early majority, late majority, and laggards. This can be perceived as a continuum with innovators as the active information-seeker who is quick to adopt on one end and laggards who are slowest to adopt on the opposite end. Rogers identified the following influences on the rate of progression through the innovation-decision process: previous practice and felt needs, nature of the social system or organization, characteristics of the decision-making unit, perceived characteristics of the innovation, and communication channels between the sender and the receiver of information about the innovation.

Factors positively related to organizational innovativeness include individual or leader characteristics and internal or external characteristics of the organization. These factors may affect the nurse's level of adoption of practice guidelines. Examples of influencing factors are the number of staff, the climate for change, the resistance to change, the goals and philosophy of the office, and the existence of pain management policies.

Rogers (1995) identified characteristics that correlate with being an early adopter of an innovation as socioeconomic factors, social factors, and personality

factors. Socioeconomic factors that are positively associated with innovativeness include higher levels of formal education, literacy, social status (higher income, level of living, possession of wealth, occupational prestige, self-perceived identification with a social class), and upward social mobility (on the move towards higher levels of social status). Age is an inconsistent determinant of innovativeness.

Rogers (1995) calls the degree that individuals are in social contact outside their immediate social circle the degree they are cosmopolite. This means they are widely traveled, not radically committed to the group, and open to ideas of the larger society. Earlier adopters have more contact with change agents and more exposure to mass media, they seek information about innovations, they have greater knowledge of innovations, and they possess a higher degree of opinion leadership.

Rogers (1995) identified the following characteristics or attributes of innovations that help to explain differences in the rate of adoption: trialability, relative advantage, compatibility, complexity, and observability. Trialability is the extent to which an innovation may be tested or tried before adoption. An innovation adopted more rapidly is perceived to have an advantage over the idea it is replacing, compatibility with the values, experience, and needs of the adopter, offer ease of application, and possess observable positive influence on outcomes. The more of these characteristics the innovation possesses, the quicker the adopter will move from knowledge of the innovation to adoption into practice.

The form of an innovation is its directly observable physical appearance and substance. Function is the effect of the innovation on the adopter. Rogers (1995) stressed the importance of understanding not only the form and function of an innovation, but also the meaning of the innovation. Meaning is the subjective and often unconscious perception of an innovation by the adopter. Meaning, or perception, is the most resistant to diffusion because of this subjective nature. Understanding of the adopter's perception of the innovation is thus a crucial element to understanding its diffusion.

Moore and Benbasat (1991) state that rather than the innovation itself, it is the adopters' perceptions of *using* the innovation that determines whether the innovation is disseminated. Dissemination is a behavior that is influenced by the adopters' perceptions of using the innovation, not the perception of the innovation as an object. For example, it is not the guideline itself that influences the behavior, but the perceived usefulness of the guideline that will influence dissemination.

The Perceived Characteristics of Innovating (PCI) by Moore and Benbasat (1991) follows the approach posited by Rogers (1995) related to the importance of perceived characteristics of the innovation, but focuses on the perception of using the innovation. The authors developed an instrument to measure the perceptions of adopting an information technology innovation based on the five characteristics identified by Rogers (trialability, relative advantage, compatibility, complexity, and observability). Moore and Benbasat surveyed existing instruments to choose appropriate items, created necessary new items, and then



undertook an extensive scale development process. The following constructs emerged: trialability (degree to which using an innovation may be tested prior to implementation), voluntariness (degree that the use of an innovation is seen as of free will), relative advantage (degree that using an innovation is seen as better than using the initiative it is to replace), compatibility (extent using the innovation is seen as consistent with current values, historical experience, and needs of the adopter), image (degree that use is seen to enhance social status), ease of use (degree that using the innovation is free of effort), result demonstrability (degree to which the outcomes of an innovation are evident and communicable), and visibility (degree the innovation is able to be seen).

Practice guidelines established by professional practice specialty organizations consist of recommendations established from evidence and determined by expert consensus to be effective. The nature of these recommendations means that experts have already acknowledged them as best practice initiatives based upon systematic review of appropriate literature. These specialty organizations' guidelines are considered standards of care for that specific professional specialty practice arena. Members of these professional organizations then adopt the recommendations and precedents are set for adopters, acting as a vicarious trial. Moore and Benbasat (1991) found that in an organizational context, the construct of trialability might be dropped, resulting in seven remaining constructs (voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, and visibility). The entire process from

knowledge of an innovation to making a decision to accept or reject the innovation is called the innovation-decision process.

There are five main steps in the innovation-decision process described by Rogers (1995): knowledge, persuasion, decision, implementation, and confirmation. Knowledge is defined as the individual (or decision making unit) first learning of an innovation and is achieved when the information as to how and why the particular innovation works is wanted. Characteristics of the decision-making unit such as socioeconomic factors, personality variables, and methods of communication influence the knowledge process and initiation of the innovation-decision process.

Persuasion is defined as the formation of a favorable or an unfavorable attitude toward the innovation following learning about the innovation. Rogers (1995) includes the perceived characteristics of the innovation in the persuasion stage of the innovation-decision process model to emphasize the importance of this concept to persuasion. A decision is made following persuasion to either adopt or reject the innovation. If the decision is made to adopt an innovation, the next step is to implement or use the innovation. The final step of the innovation-decision process is confirmation. This occurs when the individual seeks reinforcement of a decision that has been made and reevaluates the decision to adopt. This step results in either continued use or discontinuation of the innovation.

The rate of progression through the innovation-decision process is influenced by the nature of the communication channels. Rogers (1995) defines

communication channels as the way information gets from one individual to another. Factors vital to the innovation-decision process are previous practice, felt needs, innovativeness, norms of the social system, characteristics of the decision-making unit, and perceived characteristics of the innovation.

The steps of the innovation-decision process are time-ordered – it takes a certain amount of time to go through the process. Rogers (1995) defines rate of adoption as the relative time it takes for members of a social system to adopt an innovation. Investigation into the perceived characteristics of clinical practice guidelines for cancer-related pain and fatigue, the level of adoption of these innovations, and consideration of the amount of time since introduction will help determine more innovative strategies for more rapid guideline adoption by oncology nurses, thus providing optimal care to oncology patients.

Rogers' (1995) diffusion of innovations theory is often used to study the implementation of guidelines (Greene, 1997; Lia-Hoagberg et al., 1999; Olade, 2004; Rutledge et al., 1996), yet few nursing studies have included the assessment of perception of the innovation. Rutledge and colleagues investigated the extent of adoption of eight nursing practices using aspects of Rogers' diffusion of innovations theory, but did not inquire as to the perceptions of these practices. Greene assessed the perception of cancer pain as a problem and the perceived barriers to use of pain management guidelines, excluding the perception of the guideline. Olade used Rogers' theory to investigate rural nurse use of guidelines using a survey developed by the author, but failed to investigate perceptions of the guidelines.

Lia-Hoagberg et al. (1999) created a survey that investigated dissemination and use of public health guidelines using a survey that assessed perceptions, use, and factors that hinder or enhance implementation of the guidelines. This study investigated the use of public health nursing practice guidelines by both public health nurses and agency directors. Rogers' (1995) attributes of relative advantage, compatibility, complexity, trialability, and observability were used. The author found that although the participants believed the guidelines were important, they identified many factors preventing their use. Lia-Hoagberg et al. assessed perception of the guidelines as innovations, yet reliability and validity of the instrument were not reported. A reliable instrument was needed that included this crucial part of Rogers' diffusion theory in clinical practice guideline research.

### Research Design and Methods

This study utilized a correlational descriptive research design. Data were gathered with survey methodology. An online survey format was used to evaluate the level of adoption of the cancer-related pain and fatigue guidelines, nurse perception of using the clinical practice guidelines, and to examine the relationships between the selected factors and the level of adoption. These results were compared to the results obtained by Greene (1997) and Rutledge et al. (1996). In addition to this main survey, a field study was conducted to evaluate the equivalency of the Web survey administration to traditional mail survey administration.

### Sample and Setting

The sample was drawn from the 24,468 members of the ONS. Included in this study were oncology nurses who worked in the United States in the outpatient setting, in direct patient care, and had an email address on file with ONS. The sample for this study consisted of 8,000 nurses who were randomly drawn from the ONS membership meeting criteria. An additional 100 nurses who were not included in the Web survey sample, met the same criteria, and had a mailing address on file with ONS were selected to participate in the mail survey. The study was conducted over three months and was planned in waves until the minimal desired sample size of 377 were obtained. The initial wave was to 2,000, the second wave was to 2,000, and the third wave was to 4,000 ONS members.

### Measures

A self-report survey adapted from instruments used in prior diffusion research studies of nursing practice and research utilization was used for this study. Instruments included questions designed by Greene (1997) to determine level of adoption for pain guidelines that were modified to also measure the level of adoption of fatigue guidelines. Also included in this questionnaire were the Oncology Nursing Practice Questionnaire (ONPQ) (Rutledge et al., 1996), the Research Utilization in Nursing Survey (RU-N) (Greene, 1997), and the PCI (Moore & Benbasat, 1991). These scales and demographic and clinical practice questions were merged into a single instrument that was prepared in both a paper and a Web format. This Web format instrument was prepared following Dillman's (2007) recommendations, including utilization of a multiple contact

strategy, presentation of each question in a format similar to the paper questionnaire, restraint from use of color and graphics, and not requiring respondents to answer each question.

#### Adoption of Pain and Fatigue Guidelines

To measure level of adoption of the cancer-related pain and fatigue guidelines, the scoring system developed by Greene (1997) was used. A composite score of two questions determined the adoption score. The first question ascertained whether the nurse knew about the guidelines and about the practice recommendations covered by the guidelines. The second question determined whether the nurse made any changes based on the guidelines. Separate adoption scores (range of 0 to 4) were given for adoption of pain and fatigue guidelines.

#### Oncology Nursing Practice Questionnaire

The ONPQ (Rutledge et al., 1996) measured nurse adoption of oncology-related research findings. The nursing practice questionnaire (Brett, 1987) was modified into the ONPQ to assess use of oncology practices in the outpatient setting. The ONPQ described eight practices, and asked the participant to answer questions based on Rogers' (1995) model about awareness, persuasion, and implementation for each practice. Rutledge and colleagues established the ONPQ as psychometrically adequate ( $\alpha = 0.75$ ). This questionnaire was reduced to include only items related to pain and fatigue for the current study. Except for

the scale measuring fatigue assessment ( $\alpha = .68$ ), the internal consistency reliability for the current study was consistent with Rutledge et al. ( $\alpha = .70$  to  $.76$ ).

Adoption of three nursing practices for pain and three nursing practices for fatigue was determined with 36 items. Questions to determine adoption of three specific practices for pain included systematic pain assessment (six items), scheduled pain medication (six items), and nonpharmacologic techniques for pain (six items). Questions to determine adoption of three specific practices for fatigue included fatigue assessment (six items), exercise for fatigue (six items), and nonpharmacologic techniques for fatigue (six items). The questions asked if the participant had read any literature about the practice, had heard about the practice, had any other sources of information about the practice, if nurses in the office used the practice, if nurses should use the practice, if the participant used the practice, and if any policies or procedures support the practice.

The level of adoption of the three specific nursing practices for the management of cancer-related pain and three specific nursing practices for the management of cancer-related fatigue were determined by aggregation of three questions for each practice for pain and three questions for each practice for fatigue. The first question measured awareness of the practice by questioning the nurse's sources for information about the guidelines (literature, in-service or conference, and other sources) and whether nurses in the office used the guidelines. The second question determined whether the nurse was persuaded that the practice should be done. The third question asked if the nurse used the practice. Scoring as set forth by Greene (1997) and Rutledge et al. (1996) was

used to determine the extent of adoption. A total score was given (range of 0 to 4); higher scores indicate greater adoption.

### Research Utilization in Nursing

The RU-N contained Likert scales and one open-ended question for a total of 42 questions. Thirty-nine questions were from the RU-N questionnaire, which was designed to assess research utilization in the inpatient setting (Crane et al., 1990). Greene (1997) modified the questions to measure variables pertaining to the nurse as an adopter and factors in the office practice setting that may affect the level of adoption of practice guidelines. A question assessing change agency was added by Greene to measure the extent to which the nurse had been responsible for implementing change in the practice setting. Two items (NCCN and Internet) were added to the question about sources of information for problem solving specifically for this study. Greene found strong internal consistency reliability for the subscales ( $\alpha = .82$  to  $.91$ ), except for the three-item scale measuring cosmopolitanness ( $\alpha = .66$ ). Internal consistency for the current study was consistent with Greene's (1997) results for most scales ( $\alpha = .85$  to  $.91$ ) including the cosmopolitanness scale ( $\alpha = .67$ ).

The section of the RU-N labeled *Changing Practice in Your Office* included variables of the nurse as an adopter, the nurse as the change agent, the degree of cosmopolitanness, and the degree of opinion leadership. Variables that make up the characteristics of the nurse evaluated the nurse's perception of pain (two items) and fatigue (two items) as a problem, the perceived importance of improving pain management (two items) and fatigue management (two items),



exposure to the guidelines (16 items), the number of copies of each guideline the nurse had read (two items), change agency (one item), opinion leadership (four items), and cosmopolitaness (three items). Also included were age (one item), gender (one item), education (two items), certification (six items), work experience (two items), and sources for information (15 items).

Variables used to characterize the practice setting included the organization size (one item) and composition (four items). Organization variables included the organization climate for change (seven items) and resistance to change (seven items). Other organization variables included context (five items) and policies supporting nursing practices (six items).

#### Perceived Characteristics of Innovating

Moore and Benbasat (1991) developed the PCI as a general scale to measure perceptions of innovations. The scale used for this study consisted of seven constructs (voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, and visibility) for 23 items for pain and 23 items for fatigue – a total of 46 items. Moore and Benbasat found this seven-construct scale reliable for all scales ( $\alpha \geq .79$  to  $.90$ ). The seven-point Likert scale used by Moore and Benbasat was reduced to a six-point Likert scale to maintain consistency throughout the questionnaire. Consistent with Moore and Benbasat, the PCI questionnaire was internally consistent for all constructs with the pain guidelines ( $\alpha = .78$  to  $.94$ ), and for most of the constructs with the fatigue guidelines ( $\alpha = .89$  to  $.97$ ) with the exception of result demonstrability ( $\alpha = .70$ ) and visibility ( $\alpha = .62$ ).

The PCI consisted of the following constructs: voluntariness (four items), relative advantage (10 items), compatibility (six items), image (six items), ease-of-use (8 items), result demonstrability (8 items), and visibility (four items). There was a six-point Likert scale (range of 1 to 6). The individual score for each construct consisted of the mean determined separately for each construct for pain and each construct for fatigue. A mean score was determined for each construct. Higher scores were consistent with a more positive perception of each construct.

#### Demographic and Clinical Profiles

Nurse and practice setting characteristics were measured with 21 items. A questionnaire was developed to elicit specific demographic and clinical variables of the nurse, the practice, and the practice setting. Question stems were followed by either free text or multiple-choice responses.

Demographic questions concerned the practice setting, the nurse's role in the practice, the hours worked, and the amount of time in direct patient care. The purpose of these questions was to ensure that the participant met the eligibility criteria for this study. In addition, these questions allowed testing of the demographic variables as influencing factors of adoption.

#### Summary of the Instrument

The final instrument contained 96 questions. The level of adoption of the pain and fatigue guidelines consisted of 20 questions (10 for pain and 10 for fatigue). Measurement of adoption of three nursing practices consisted of 36

questions (18 for pain and 18 for fatigue). Measurement of the nurse's perception of the pain and fatigue guidelines consisted of 14 questions (seven for pain and seven for fatigue). Seven questions measured the characteristics of the nurse as an adopter and factors pertaining to the practice setting that might influence adoption by the nurse. Demographic characteristics of the nurse and characteristics of the practice setting were measured with 18 questions. An open-ended question was included at the end of the survey to elicit additional comments.

### Procedures

The Institutional Review Board of the University of Utah provided approval for this study. Study procedures were conducted over a three-month period in three waves to three different groups of ONS members. Each group received three contacts (prenotice email, invitation email, and reminder email). The marketing company contracted by ONS for management of the ONS list-serve conducted all three waves by sending out three emails for each of the three waves. The first email was the prenotice email. The second email contained an invitation letter, information on the incentive gift certificate, and a link to the Web survey on the University of Utah Health Services Center Mission-Based Management (MBM) E-Survey system for participation. The third email was a reminder about the study and the incentive, and contained a link to the survey. All Web survey responses were uploaded from the MBM E-Survey system into an Excel file, which was then converted electronically into an SPSS file.

The 100 potential mail participants were contacted three times. The first contact was a prenotice letter. The second contact was mailed one week later and consisted of an invitation letter, the survey, a stamped return envelope, and an incentive gift certificate. The final contact was mailed two weeks after the invitation and was a reminder letter. The responses were entered into an SPSS data file by the investigator to allow analysis. The SPSS format used was identical to the format established for the Web survey.

### Data Analysis

SPSS Version 20.0 was used for data analysis. Descriptive statistics were used to examine the clinical and demographic characteristics of the participants. The data were examined for frequency of variables and identification of outliers and extreme cases. Measures of central tendency (mean, median, and mode), variability (standard deviations), and correlations were used. The following analyses were undertaken based on the research aim, question, or hypothesis.

#### Aim 1

The first aim was to determine the level of adoption by oncology nurses of clinical practice guidelines and specific practices for cancer-related pain and fatigue. Adoption was determined by summing the scores of two questions for pain and two questions for fatigue. A mean adoption score was assigned (range of 0 to 4). Because the steps of the innovation-decision process are time-ordered and it takes a certain amount of time to go through the process (Rogers, 1995), the author hypothesized that adoption of pain guidelines would be greater than

adoption of fatigue guidelines. This hypothesis was tested by comparing the results of adoption of pain guidelines to the results of adoption of fatigue guidelines. A paired *t*-test was used to evaluate the differences between adoption of the pain and fatigue guidelines with a significance level of .05 used.

To determine the level of adoption of the specific recommended practices for pain (assessment, scheduled medications, and nonpharmacologic techniques) and for fatigue (assessment, exercise, and nonpharmacologic techniques), awareness, persuasion, and use were assessed using the scoring system of Greene (1997) and Rutledge et al. (1996). A mean adoption score was assigned (range of 0 to 4) for each of the three practices for pain and for each of the three practices for fatigue. Separate one sample *t*-tests were used to compare the respondents' responses with those of Greene or Rutledge et al.

This author hypothesized that adoption of the pain and fatigue guidelines and practices would have increased since adoption levels reported by Greene (1997) and Rutledge et al. (1996). To test this hypothesis, the current results obtained for the adoption of pain guidelines and for each of the three pain practices (assessment, scheduled medication, and nonpharmacologic techniques) were compared with the results obtained by Greene using separate one sample *t*-tests. Separate one sample *t*-tests were used to compare the current results for the practices of pain assessment and nonpharmacologic techniques for pain to results from Rutledge et al. for the same variables. A one-sample *t*-test was used to compare the current results obtained for the adoption of the practice of fatigue assessment with the results obtained by Rutledge et al.

I hypothesized that nurse characteristics, organizational characteristics, and nurse perception of using the guidelines would influence adoption of the pain and fatigue guidelines. The influence organizational characteristics, nurse characteristics, and nurse perception of using the guidelines had on adoption of the pain and fatigue guidelines were evaluated. Adoption of pain guidelines or fatigue guidelines was the dependent variable. Variables examined were the nurse characteristics (cosmopolitaness, opinion leadership, nursing experience, and education), organization characteristics (size, climate for change, resistance to change, context, and policies supporting nursing practices), and perceptions of using the pain and fatigue guidelines. Multiple regression analyses using the backward method were utilized to determine which nurse characteristics, organization characteristics, and nurse perceptions of using the guidelines influenced pain and fatigue adoption.

## Aim 2

The second aim of this study was to compare the scores of the Web survey method of delivery and mail survey method of delivery. The hypotheses were that there would be no difference in scores and no difference in demographic descriptors between Web survey and paper survey modes of delivery. To test these hypotheses, the survey was prepared in two formats – one for Web distribution and one for mail distribution. The scores used to test the first hypothesis included the adoption scores for pain and fatigue, and adoption scores for three specific practices for pain (assessment, scheduled medication, and nonpharmacologic techniques) and fatigue (assessment exercise, and non-

pharmacologic techniques). Because the data were not normally distributed, this hypothesis was tested using separate Mann-Whitney U tests with significance set at .05.

The second hypothesis was that there would be no difference in demographic descriptors of respondents by mode of survey delivery. The scores used to test this hypothesis were setting, role, hours worked, time in direct patient care, nursing experience, oncology nursing experience, education, and certification. Because this data were not normally distributed, this hypothesis was tested with Chi-square tests.

#### Significance of the Study

The purpose of this study was to assess adoption of clinical practice guidelines by outpatient oncology nurses for management of symptoms related to cancer and its treatment. The literature supports the potential for improved patient care and outcomes with the use of guidelines. Guidelines are widely available to support management of a variety of healthcare problems, including cancer-related pain and fatigue, yet widespread use of guidelines has not occurred. Research was needed to determine ways to encourage widespread adoption of guidelines. A first step was to measure a baseline level of knowledge and use of guidelines to assist with determination of strategies of how best to support more timely dissemination and implementation of guidelines.

Cancer-related pain and cancer-related fatigue have been shown to be prevalent problems recognized by leaders in oncology as priority areas. Evidence based guidelines have been available for management of pain and fatigue for

decades, yet these guidelines continue to be inadequately implemented.

Previous studies have evaluated the use of guidelines in management of pain and fatigue and found their use lacking. The availability of studies from more than a decade earlier created a unique opportunity for evaluation of improvement versus decline in this very important area.

Rogers' (1995) diffusion of innovations theory guided this research to identify the nurses' knowledge and use of specific clinical practice guidelines in cancer-related pain and fatigue. Rogers' theory offers a framework to guide the evaluative work of evidence-based guideline dissemination as it addresses many of the complex factors relevant to knowledge acquisition and utilization in practice. This theory is a combination of basic principles of effective factors for promotion of dissemination and utilization of knowledge. Rogers' determination of important factors that influence progression through the innovation-decision process helped to determine research strategies to explore these factors. Instruments from previous studies that used Rogers' framework to guide their research are available (Estabrooks, 1999; Greene, 1997; Moore & Benbasat, 1991; Rutledge et al., 1996). Use of these previously validated scales to create the survey increased the probability of obtaining reliable information.

The sample for this study consisted of oncology nurses practicing in the U.S., at all education levels, working in the outpatient setting in medical oncology, in direct patient care, able to read English and with an Internet email address on file with ONS. This was a list-based Web survey, used in an attempt to reach a diverse population across the U.S. This research compared the paper



survey version and the Web survey versions of the ONPQ (Rutledge et al., 1996), the RU-N (Greene, 1997), and the PCI (Moore & Benbasat, 1991) to determine the effect on reliability, response, and results.

In summary, this research investigated perceived characteristics of using the pain and fatigue guidelines, characteristics of the nurse, and characteristics of the organization, and identified factors that generated a tendency towards pain or fatigue guideline adoption. These results provide a baseline of outpatient oncology nurse current level of adoption of pain and fatigue guidelines and specific practices and an understanding of the factors associated with adoption. Researchers can apply results of this research to develop strategies to encourage use of evidence-based practice by outpatient oncology nurses.

## References

- Aiello-Laws, L., Reynolds, J., Deizer, N., Peterson, M., Ameringer, S., & Bakitas, M. (2009). Putting evidence into practice: What are the pharmacologic interventions for nociceptive and neuropathic cancer pain in adults? *Clinical Journal of Oncology Nursing*, 13(6), 649-655. doi:10.1188/09.CJON.649-655
- American Academy of Hospice and Palliative Medicine. (2007). *U.S. clinical practice guidelines for quality palliative care, The National Consensus Project 2007*. Retrieved from <http://www.aahpm.org>
- American Academy of Pain Medicine. (1998). *Acute pain and cancer pain. A position statement from the American Academy of Pain Medicine*. Retrieved from <http://www.painmed.org/Workarea/DownloadAsset.aspx?id=3272>
- American Geriatric Society. (2009). Pharmacological management of persistent pain in older persons. *Journal of the American Geriatric Society*, 57(8), 1331-1346. doi:10.1111/j.1532-5414.2009.02376.x
- American Pain Society Quality of Care Committee. (1995). Quality improvement guidelines for the treatment of acute pain and cancer. *Journal of the American Medical Association*, 274(23), 1874-1880.
- American Society of Anesthesiologists. (1996). Practice guidelines for cancer pain management. *Anesthesiology*, 84, 1243-1257.
- Aragon, D., Sole, M. L., & Brown, S. (2005). Outcomes of an infection prevention project focusing on hand hygiene and isolation practices. *AACN Clinical Issues*, 16(2), 121-132. doi:10.1097/00044067-200504000-00002
- Ayello, E. A., Baranoski, S., & Salati, D. S. (2005). A survey of nurses' wound care knowledge. *Advances in Skin & Wound Care*, 18(5 Pt 1), 276-278. doi:10.1097/00129334-200506000-00014
- Benedetti, C., Brock, C., Cleeland, C., Dube, J. E., Ferrell, B., Hassenbusch, S., ... Weinstein, S. M. (2000). NCCN practice guidelines for cancer pain. *Oncology (Williston Park)*, 14(11A), 135-150.
- Berger, A. M., & Mitchell, S. A. (2009). Accelerating the research translation continuum to improve oncology nursing sensitive patient outcomes. In C. King & J. Phillips (Eds.), *Advancing oncology nursing science* (pp. 315-349). Pittsburgh, PA: Oncology Nursing Society Press.

- Bliss-Holtz, J. (2007). Evidence-based practice: A primer for action. *Issues in Comprehensive Pediatric Nursing*, 30, 165-182.  
doi:10.1080/01460860701738336
- Bogdan-Lovis, E. A., & Sousa, A. (2005). The contextual influence of professional culture: Certified nurse-midwives' knowledge of and reliance on evidence-based practice. *Social Science & Medicine*, 62, 2681-2693.  
doi:10.1016/j.socscimed.2005.11.027
- Borneman, T., Piper, B. F., Sun, V. C., Koczywas, M., Uman, G., & Ferrell, B. (2007). Implementing the fatigue guidelines at one NCCN member institution: Process and outcomes. *Journal of the Comprehensive Cancer Network*, 5(10), 1092-1011.
- Brett, J. L. (1987). Use of nursing practice research findings. *Nursing Research*, 36(6), 344-349.
- Charlton, B. G., & Miles, A. (1998). The rise and fall of EBM. *Quarterly Journal of Medicine*, 91, 371-374.
- Chung, S. K., Ahn, M. J., Yoo, J. Y., Choi, M., Hyang, N., Woo, ... Oh, E. G. (2011). Implementation of best practice for chemotherapy-induced nausea and vomiting in an acute care setting. *International Journal of Evidence-Based Healthcare*, 9, 32-38. doi:10.1111/j.1744-1609.2010.00198.x
- Crane, J., Horsley, J., Stewart, B., & Shepherd, P. (1990, May). *The research utilization survey instrument*. Poster presented at the meeting of the Western Society for Research in Nursing, Denver, CO.
- Cunningham, R. S. (2006). Clinical practice guideline use by oncology advanced practice nurses. *Applied Nursing Research*, 19, 126-133.  
doi:org/10.1016%2Fj.apnr.2005.06.003
- Curt, G.A. (2000). The impact of fatigue on patients with cancer: Overview of FATIGUE 1 and 2. *The Oncologist*, 5(Suppl 2), 9-12.  
doi:10.1634/theoncologist.5-suppl\_2-9
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2<sup>nd</sup> ed.). Hoboken, NJ: John Wiley & Sons.
- Donaldson, N. E., Rutledge, D. N., & Jeffrey, A. (2004). Outcomes of adoption: Measuring evidence uptake by individuals and organizations. *Worldviews on Evidence-Based Nursing*, 1(S1), S41-S52. doi:10.1111/j.1524-475X.2004.04048.x

- Dykes, P. C., Acevedo, K., Boldrighini, J., Boucher, C., Frumento, K., Gray, P., ... Bakken, S. (2005). Clinical practice guideline adherence before and after implementation of the HEARTFELT (heart failure effectiveness & leadership team) intervention. *Journal of Cardiovascular Nursing*, 20(5), 306-314.
- Estabrooks, C. A. (1999). The conceptual structure of research utilization. *Research in Nursing & Health*, 22(3), 203-216. doi:10.1007/(SICI)1098-240X(199906)22:3<203::AID-NUR3>3.0.CO;2-9
- Freemantle, N., Harvey, E. L., Wolf, F., Grimshaw, J. M., Grilli, R., & Bero, L. A. (2005). Printed educational materials: Effects on professional practice and health care outcomes. *The Cochrane Database Systematic Review*, 3. doi:10.1002/14651858.CD000172
- Given, B., Given, C. W., McCorkle, R., Kozachik, S.K., Cimprich, B., Rahbar, M. H., & Wojcik, C. (2002). Pain and fatigue management: Results of a nursing randomized clinical trial. *Oncology Nursing Forum* 29(6), 949-956. doi:10.1188/02.ONF.949-956
- Gordon, D. B., Dahl, J. L., Miaskowski, C., McCarberg, B., Todd, K. H., Paice, J. A., & Carr, D. B. (2005). American Pain Society recommendations for improving the quality of acute and cancer pain management. *Archives of Internal Medicine*, 165(14), 1574-1580. doi:10.1001/archinte.165.14.1574
- Graham, A. L., Papandonatos, G. D., Bock, B. C., Cobb, N. K., Baskin-Sommers, A., Niaura, R., & Abrams, D. B. (2006). Internet- vs. telephone-administered questionnaires in a randomized trial of smoking cessation. *Nicotine & Tobacco Research*, 8(Supplement 1), S49-S57. doi:10.1080/14622200601045367
- Grant, M., Golant, M., Rivera, L., Dean, G., & Benjamin, H. (2000). Developing a community program on cancer pain and fatigue. *Cancer Practice*, 8(4), 187-194. doi:10.1046/j.1523-5394.2000.84012.x
- Greene, P. E. (1997). *Diffusion of innovations in cancer pain management and barriers to changing practice: A study of office practice oncology nurses* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations database. (Publication No. AAT9812155).
- Grimshaw, J. W., Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., ... O'Brien, M. A. (2001). Changing provider behavior: An overview of systematic reviews of interventions. *Medical Care*, 39(8 Suppl 2), I12-145.
- Guyatt, G. (1991). Evidence-based medicine. *Annals of Internal Medicine*, 114(Supplement 2), A-16, 114.

- Hadorn, D. C., Baker, D., Hodges, J. S., & Hicks, N. (1996). Rating the quality of evidence for clinical practice guidelines. *Journal of Clinical Epidemiology*, 49, 749-754. doi:10.1016/0895-4356(96)00019-4
- Herr, K., Coyne, P. J., Key, T., Manworren, R., McCaffery, M., Merkel, S., ... Wild, L. (2002). Pain assessment in the nonverbal patient: Position statement with clinical practice recommendations. *Pain Management Nursing*, 7(2), 44-52. doi:10.1016/j.pmn.2006.02.003
- Hofman, M., Ruan, J. L., Fiogueroa-Moseley, C. D., Jean-Pierre, P., & Morrow, G. R. (2007). Cancer-related fatigue: The scale of the problem. *Oncologist*, 12(Supplement 1), 4-10. doi:org/10.1634%2Ftheoncologist.12-S1-4
- Hollen, C. J., Hollen, C. W., & Stolte, K. (2000). Hospice and hospital oncology nurses: A comparative survey of knowledge and attitudes about cancer pain. *Oncology Nursing Forum*, 27(10), 1593-1599.
- Hysong, S. J., Best, R. G., & Pugh, J. A. (2006). Audit and feedback and clinical practice guideline adherence: Making feedback actionable. *Implementation Science*, 1(9). doi:10.1186/1748-5908-1-9
- Idell, C. S., Grant, M., & Kirk, C. (2007). Alignment of pain reassessment practices and National Comprehensive Cancer Network guidelines. *Oncology Nursing Forum*, 34(3), 661-671. doi:10.1188/07.ONF.661-671
- Innis, J., Bikaunieks, N., Petryshen, P., Zellermyer, V., & Ciccarelli, L. (2004). Patient satisfaction and pain management: An educational approach. *Journal of Nursing Care Quality*, 19(4), 322-327. doi:10.1097/00001786-200410000-00006
- Jacox, A., Carr, D. B., & Payne, R. (1994). New clinical-practice guidelines for the management of pain in patients with cancer. *New England Journal of Medicine*, 330, 651-655. doi:10.1056/NEJM199403033300926
- Jordan, K., Sippel, C., & Schmoll, H. (2007). Guidelines for antiemetic treatment of chemotherapy-induced nausea and vomiting: Past, present, and future recommendations. *The Oncologist*, 12(9), 1143-1150. doi:101634/theoncologist.12-9-1143
- Kirchhoff, K. T. (2004). State of the science of translational research: From demonstration projects to intervention testing. *Worldviews on Evidence-Based Nursing*, 1(S1), S6-S12. doi:10.1111/j.1524-475X.2004.04039.x

- Kitson, A., Harvey, G., & McCormack, B. (1998). Enabling the implementation of evidence based practice: A conceptual framework. *Quality in Health Care*, 7, 149-158. doi:10.1136/qshc.7.3.149
- Levac, K. A. (2002). Putting outcomes into practice in physician offices. *Journal of Nursing Care Quality*, 17(1), 55-66. doi:10.1097/00001786-200210000-00007
- Lia-Hoagberg, B., Schaffer, M., & Strohschein, S. (1999). Public health nursing practice guidelines: An evaluation of dissemination and use. *Public Health Nursing*, 16(6), 397-404. doi:10.1046/j.1525-1446.1999.00397.x
- Logan, J., & Graham, I. (1998). Toward a comprehensive interdisciplinary model of health care research use. *Science Communication*, 20, 227-246. doi:10.1177/1075547098020002004
- Mahon, S. M., Williams, M. T., & Spies, M. A. (2000). Screening for second cancers and osteoporosis in long-term survivors. *Cancer Practice*, 8(6), 282-290. doi:10.1046/j.1523-5394.2000.86008.x
- Martin, S., & Larson, E. (2003). Chemotherapy-handling practices of outpatient and office based oncology nurses. *Oncology Nursing Forum*, 30(4), 575-581. doi:10.1188/03.ONF.575-581
- McDonald, L. (2001). Florence Nightingale and the early origins of evidence-based nursing. *Evidence Based Nursing*, 4(3), 68-69. doi:10.1136/ebn.4.3.68
- McGuire, D. B. (2004). Occurrence of cancer pain. *Journal of the National Cancer Institute Monographs*, 32, 51-55. doi:10.1093/jncimonographs/lgh015
- McGuire, D. B., Johnson, J., & Migliorati, C. (2006). Promulgation of guidelines for mucositis management: Educating health care professionals and patients. *Support Care Cancer*, 14, 548-557. doi:10.1007/s00520-006-0060-7
- Miaskowski, C., Cleary, J., Burney, R., Coyne, P., Finley, R., Foster, R., ... Zahbock, C. (2005). *Guideline for the management of cancer pain in adults and children* (APS Clinical Practice Guideline Series No. 3). Glenview, IL: American Pain Society (APS). doi:10.1016/pmn.2005.04.001
- Mitchell, S. A., Beck, S., L., & Eaton, L. H. (2009). Fatigue. In L. H. Eaton & J. M. Tipton (Eds.), *Putting evidence into practice: Improving oncology patient outcomes* (pp.149-174). Pittsburg, PA: Oncology Nursing Society.

- Mitchell, S., Beck, S., Hood, L., Moore, K., & Tanner, E. (2007). Putting evidence into practice: Evidence-based interventions for fatigue during and following cancer and its treatment. *Clinical Journal of Oncology Nursing*, 11(1), 99-113. doi:10.1188/07.CJON.99-113
- Mock, V. (2001). Fatigue management: Evidence and guidelines for practice. *Cancer*, 92(Suppl 6), 1699-1707. doi:10.1002/1097-0142(20010915)92:6+<1699::AID-CNCR1500>3.0.CO;2-9
- Mock, V., Atkinson, A., Barsevick, A., Cella, D., Cimprich, B., Cleeland, C., & Stahl, C. (2000). NCCN practice guidelines for cancer-related fatigue. *Oncology*, 14(11A), 151-161.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. doi:10.1287/isre.2.3.192
- Murphy, C. M., Ballon, L. G., Culhane, B., Mafrica, L., McCorkle, M., & Worrall, L. (2005). Oncology Nursing Society environmental scan 2004. *Oncology Nursing Forum*, 32(4), E76-E97. doi:10.1188/05.ONF.E76-E97
- Nail, L. (2002). Fatigue in patients with cancer. *Oncology Nursing Forum*, 29(3), 537-546. doi:10.1188/ONF.537-546
- National Comprehensive Cancer Network. (2009, January 15). *NCCN practice guidelines in oncology -- v.1.2008*. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/PDF/fatigue.pdf](http://www.nccn.org/professionals/physician_gls/PDF/fatigue.pdf)
- National Comprehensive Cancer Network. (2011, July 22). *NCCN practice guidelines in oncology -- v.2.2011*. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/PDF/pain.pdf](http://www.nccn.org/professionals/physician_gls/PDF/pain.pdf)
- Olade, R. A. (2004). Evidence-based practice and research utilization activities among rural nurses. *Journal of Nursing Scholarship*, 36(3), 220-225. doi:10.1111/j.1547-5069.2004.04041.x
- Oliver, J. W., Kravitz, R. L., Kaplan, S. H., & Meyers, F. J. (2001). Individualized patient education and coaching to improve pain control among cancer outpatients. *Journal of Clinical Oncology*, 19(7), 2206-2212.
- Oncology Nursing Society. (2006). *Cancer pain management: Oncology Nursing Society position on cancer pain management*. Retrieved from <http://www.ons.org/publications/positions/CancerPainManagement.shtml>

- Oncology Nursing Society. (2008). *Evidence based practice resource area*. Retrieved from [http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines\\_pain.pdf](http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines_pain.pdf)
- Reuben, S. H. (2005). *Translating research into cancer care: Delivering on the promise*. Bethesda, MD: U. S. Department of Health and Human Services, National Cancer Institute.
- Riva, G., Teruzzi, T., & Anolli, L. (2003). The use of the internet in psychological research: Comparison of online and offline questionnaires. *Cyber Psychology & Behavior*, 6(1), 73-80. doi:10.1089/109493103321167983
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Free Press.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.
- Rutledge, D. N., Greene, P., Mooney, K., Nail, L. M., & Ropka, M. (1996). Use of research-based practices by oncology staff nurses. *Oncology Nursing Forum*, 23(8), 1235-1244.
- Sackett, D. L., Haines, R. B., & Tugwell, P. (1985). *Clinical epidemiology*. Boston, MA: Little, Brown & Company.
- Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: What it is and what it isn't. *British Medical Journal*, 312, 71-72.
- Sherwood, G. D., Adams-McNeill, J., Starck, P. L., Nieto, B., & Thompson, C. J. (2000). Qualitative assessment of hospitalized patients' satisfaction with pain management. *Research in Nursing & Health*, 23(6), 486-495. doi:10.1002/1098-240X(200012)23:6<486::AID-NUR7>3.3.CO;2-X
- Stevens, K. R. (2006). *ACE Star model of EBP: The cycle of knowledge transformation*. Retrieved from Academic Center for Evidence-Based Practice Web Site: [http://www.acestar.uthscsa.edu/Learn\\_model.htm](http://www.acestar.uthscsa.edu/Learn_model.htm)
- Stone, P., Richardson, A., Ream, E., Smith, A., Kerr, D. J., & Kearney, N. (2000). Cancer-related fatigue: Inevitable, unimportant and untreatable. Results of a multi-centre patient survey. *Annals of Oncology*, 11(8), 971-975.
- Titler, M. G., Kleiber, C. J., Steelman, V. J., Rakel, B. A., Budreau, G., Everett, L. Q., ... Goode, C. J. (2001). The Iowa model of evidence-based practice to promote quality care. *Critical Care Nursing Clinics of North America*, 13, 497-509.



- Vogelzang, N. J., Breitbart, W., & Portenoy, R. K. (1997). Patient, caregiver, and oncologist perceptions of cancer-related fatigue: Results of a tri-part assessment survey. *Seminars in Hematology*, 34(3, Supplement 2), 4-12.
- Wells, N., McDowell, R., & Hendricks, P. (2007). Linking pain knowledge, assessment, management and patient outcome [Abstract]. *Oncology Nursing Forum*, 34(1), 170.
- Williamson, T. S. (2008). The shift of oncology inpatient care to outpatient care: The challenge of retaining expert oncology nurses. *Clinical Journal of Oncology Nursing*, 12(2), 186-189. doi:10.1188/08.CJON.186-189
- Winningham, M. L., Nail, L. M., Burke, M. B., Brophy, L., Cimprich, B., Jones, L. S., ... Piper, B. (1994). Fatigue and the cancer experience: The state of the knowledge. *Oncology Nursing Forum*, 21(1), 23-26.
- World Health Organization. (1986). *Cancer pain relief*. Geneva, Switzerland: World Health Organization.
- World Health Organization. (2007). *WHO model list of essential medicines* (15th ed.). Geneva, Switzerland: World Health Organization.

## CHAPTER 2

### ADOPTION OF PAIN AND FATIGUE GUIDELINES BY OUTPATIENT ONCOLOGY NURSES

Prepared for submission to *Oncology Nursing Forum*

### Abstract

Purpose/Objectives: To determine the current level of adoption by outpatient oncology nurses of clinical practice guidelines in the two crucial areas of cancer-related pain and cancer-related fatigue.

Design: Correlational descriptive research design with survey methods.

Setting: Outpatient oncology clinics and infusion centers.

Sample: 8,100 direct patient care outpatient oncology nurse members of ONS in the U.S.; 563 responded with usable data.

Methods: Nurse adoption for pain/fatigue guidelines was measured using questions to assess guideline adoption developed by Greene (1997), and adoption of three practices of pain and fatigue was measured using the Oncology Nursing Practice Questionnaire with the score interpretation as developed by Brett (1987).

Main Research Variables included: pain/fatigue guideline adoption and adoption of specific practices for pain (assessment, scheduled medication, and non-pharmacologic techniques) and fatigue (assessment, exercise, and non-pharmacologic techniques).

Findings: Pain adoption overall was at the *use sometimes* level. Fatigue adoption overall was at *aware* level. The three pain and fatigue practices were at the *use sometimes* level. The APN pain guideline level of adoption was *use sometimes* compared to the staff nurse level of *persuaded*.

Conclusions: Adoption of the pain and fatigue guidelines has not occurred and is still in the realm of awareness or persuasion; however, adoption of

individual recommended practices is at the *use sometimes* level. Possible reasons relate to setting, practice role, and perceptions.

Implications for nursing: Effective interventions need to be tested to improve nurse adoption of evidence-based guidelines. Educational dissemination should link evidence to the particular practice adopted by the facility.

### Introduction and Background

Using research findings to make appropriate healthcare decisions has been a part of nursing since Florence Nightingale's use of mortality data to improve the outcomes of health care for soldiers in the Crimea (McDonald, 2001). Evidence-based practice is a process of using research results to determine management of healthcare problems. Clinical practice guidelines, the products of evidence-based practice processes, have been established and distributed to help guide oncology practice. Use of these guidelines to determine treatment decisions has the potential to improve patient care and outcomes by promoting evidence-based care while discouraging unproven care.

Oncology nurses have a professional obligation to provide optimal care to their patients, yet there remains a large variation in both knowledge and actual use of evidence-based guidelines among nurses. Clinical practice guidelines to help manage healthcare and prevent complications associated with cancer and cancer treatment are widely available. Examples of symptoms addressed by guidelines that have a long history of development and dissemination by professional organizations are cancer-related pain and cancer-related fatigue

(Aiello-Laws et al., 2009; American Academy of Hospice and Palliative Medicine, 2007; American Academy of Pain Medicine, 1998; American Pain Society Quality of Care Committee, 1995; American Society of Anesthesiologists, 1996; Gordon et al., 2005; Jacox, Carr, & Payne, 1994; Mitchell, Beck, Hood, Moore, & Tanner, 2007; Mock, 2001; Mock et al., 2000; NCCN, 2009; National Comprehensive Cancer Network [NCCN], 2011; Oncology Nursing Society [ONS], 2006; ONS, 2008; World Health Organization, 1986).

Negative influences on quality of life and functional status that limit roles at home and work result from uncontrolled pain (Innis, Bikaunieks, Petryshen, Zellermeier, & Ciccarelli, 2004; Jacox et al., 1994; Oliver, Kravitz, Kaplan, & Meyers, 2001; Sherwood, Adams-McNeill, Starck, Nieto, & Thompson, 2000). These same negative results occur with uncontrolled fatigue (Curt, 2000; Given et al., 2002; Grant, Golant, Rivera, Dean, & Benjamin, 2000; Passik, & Kirsh, 2005). However, studies have reported a lack of use of both pain guidelines (Greene, 1997; Rutledge, Greene, Mooney, Nail, & Ropka, 1996; Wells, McDowell, & Hendricks, 2007) and fatigue guidelines (Borneman et al., 2007; Rutledge et al., 1996) by outpatient oncology nurses. Greene determined that outpatient oncology nurses were aware of but not using the AHCPR pain guidelines, and that they sometimes used the practices recommended by the guidelines. Rutledge found that outpatient oncology nurses sometimes used the recommended practices for both pain and fatigue management.

The purpose of the current study was to assess adoption of clinical practice guidelines by outpatient oncology nurses for management of cancer-

related pain and fatigue to assist in development of strategies to encourage widespread guideline adoption.

### Theoretical Framework

Rogers' (1995) diffusion of innovations theory addresses many of the complex factors relevant to knowledge acquisition and utilization in practice and thus was a useful theoretical framework to guide the evaluative work of evidence-based practice dissemination. Defined in Table 1 are five main steps in the innovation-decision process described by Rogers: knowledge, persuasion, decision, implementation, and confirmation. Brett (1987) modified Rogers' steps to develop a scoring system with the step of decision included in persuasion, and confirmation renamed as use always. Brett's level of adoption categories include: unaware, aware, persuaded, use sometimes, and use always.

### Materials and Methods

#### Design, Participants, Setting

A correlational descriptive research design with online survey format methods was used to evaluate the outpatient oncology nurses' awareness and use of clinical practice guidelines for management of cancer-related pain and fatigue. The 36,066 members of the Oncology Nursing Society (ONS) membership in the outpatient setting within the U.S. consisted of 24,468 members with email addresses. As reported in Table 2, the majority of these members were Bachelor's prepared ( $n=10,182$ , 43%) and worked in the outpatient setting ( $n=12,611$ , 51.5%) in direct patient care positions ( $n=16,424$ ,

67.1%), and most are staff nurses ( $n=13,839$ , 56.5%). Of the total ONS membership, 52.7% ( $n=19,006$ ) are oncology certified and 4.9% ( $n=1,769$ ) are advanced oncology certified nurses (Linda Jordan, Certification Specialist, Oncology Nursing Certification Corporation, personal communication, October 15, 2012).

A sample of 8,000 nurses with email addresses registered with ONS was randomly selected from the membership of the ONS. The nurses practiced in the United States, were at all education levels, and worked in direct patient care in the outpatient setting. An additional 100 members, not included in the 8,000 and who met this same criteria in addition to having a mailing address on file with ONS, were included for the substudy.

For this study, a total of 8,100 invitations were submitted and 778 surveys were completed. Of these, 563 responded with usable data (7.0% response rate). As seen in Table 2, the largest number of nurses was baccalaureate-prepared for both ONS ( $n=10,182$ , 42.7%) and the current study ( $n=241$ , 45.3%), and the majority of the nurses with ONS ( $n=13,839$ , 56.5%) and this study ( $n=316$ , 56.1%) were staff nurses. The sample for this study had a larger percentage of nurses who worked in hospital outpatient clinics ( $n=390$ , 69.3%) compared to the number of outpatient nurses in ONS that worked in hospital clinics ( $n=5,041$ , 41.2). More of the nurses in the current study were oncology certified ( $n=404$ , 71.8%) compared to ONS ( $n=10,006$ , 52.7%). Participants for the current study had an average of 22 years of nursing experience and 14.5 years of oncology nursing experience.

## Measures

An online survey was used to examine the level of adoption of clinical practice guidelines for cancer-related pain (assessment, scheduled pain medication, and nonpharmacologic techniques) and cancer-related fatigue (assessment, exercise, and nonpharmacologic techniques). The survey included questions developed by Greene (1997) to assess adoption of pain and fatigue guidelines, and questions about specific practices for both pain and fatigue found on the Oncology Nursing Practice Questionnaire (Rutledge et al., 1996), along with specific demographic data assessing the nurses' work setting, role, and education.

Greene (1997) used two questions to measure adoption of a pain guideline that asked the nurse to report awareness and use of the guideline. Three questions asked whether the nurse had read a copy of the guideline, if so which copy, and what were the sources of exposure to the guideline. In addition to the five questions related to pain, the current study included five similar questions related to fatigue (Table 3).

The Oncology Nursing Practice Questionnaire (ONPQ) (Rutledge et al., 1996) measured nurse adoption of oncology-related research findings. The questionnaire described eight practices, and asked the participant to answer questions based on awareness, persuasion, and implementation for each practice. For this survey, the questionnaire included only ONPQ items related to pain and fatigue. Rutledge et al. found adequate internal consistency reliability ( $\alpha$



= .68 to .95). The current study supported this finding for the same scales ( $\alpha$  = .68 to .76).

### Procedures

The Institutional Review Board at the University of Utah provided approval for this study. The survey was primarily a World Wide Web survey ( $n = 8,000$ ), with 100 nurses sent a mailed survey. Invitees were randomly chosen from those members of the ONS who met study criteria. The Web survey was prepared on E-Survey through University of Utah Mission Based Management (MBM). The principles advocated by Dillman (2007) were used to guide the Web survey administration procedures. The management company contracted with ONS emailed the invitations. The recommended three contacts for the Web survey administration consisted of a prenotice email, an email invitation with a link for access to the Web survey, and a final reminder email with a link to the Web survey. Respondents consented to participation by clicking on the link to the Web survey provided in the invitation and reminder emails, and took the survey electronically. At the beginning of the survey, participants were asked to provide an email address for a \$5.00 gift certificate to be emailed to them upon completion of the survey in appreciation for their time. One hundred surveys were administered via the United States postal service. The multiple mail contacts consisted of a prenotice letter, a mailed survey with an addressed stamped return envelope and a \$5.00 gift certificate, and a reminder letter.

The results of the completed surveys were uploaded from MBM into an Excel file. This Excel file was then converted to an SPSS for Windows (v. 20) file

for analysis. Data from the returned postal surveys were combined with the Web surveys for analysis.

## Results

### Pain as a Problem

As seen in Table 4, 26.9% ( $n=148$ ) of respondents reported that patients' pain was very significant. The majority of the nurses ( $n=486$ , 87.3%) indicated that it was very important to improve pain management. For the most part, respondents ( $n=456$ , 84.9%) reported that their facility did a good to excellent job of managing cancer pain.

### Awareness and Use of Pain Guidelines

The level of adoption of the pain guidelines was determined using the scoring system developed by Greene (1997). The survey did not ask about one particular guideline, but rather asked questions about pain guidelines in general. A mean composite score to determine adoption was obtained (range of 0 to 4). Table 5 reports the findings for the current study and Greene. For the current study, the majority of respondents ( $n=360$ , 69.2%) had some degree of awareness of the pain guidelines, yet 30.8% ( $n=160$ ) had not heard of the guidelines. The possible level of adoption score ranged from 0 (unaware) to 4 (use always). Using Brett's (1987) scoring system, the adoption scores were categorized as: unaware ( $< 0.5$ ), aware (0.5 to 1.49), persuaded (1.5 to 2.49), use sometimes (2.5 to 3.49), and use always (3.5 to 4.0). The overall score for level of adoption of pain guidelines for the current study was 1.9 ( $SD=1.6$ ), or at the

persuaded stage of adoption. This was a significant difference ( $p < .001$ ) compared to Greene's level of 1.3 ( $SD=1.5$ ), which was at the aware stage of adoption for both studies.

### Adoption of Three Pain Practices

The level of adoption of three specific nursing practices for management of pain (systematic assessment, scheduled medication, and nonpharmacologic techniques) was determined by aggregation of four questions for each specific practice. The scoring system was that developed by Brett (1987) and used by Greene (1997) and Rutledge et al. (1996). As seen in Table 5, there was a significant difference in mean adoption scores for the current study compared to Greene for systematic pain assessment (2.9 vs. 2.5, respectively), scheduled pain medication (3.2 vs. 3.5, respectively), and nonpharmacologic techniques for pain management (2.8 vs. 2.6, respectively), with the practices of pain assessment and nonpharmacologic techniques for both studies at the *use sometimes* level. The level of adoption for scheduled pain medication was *use sometimes* for the current study and *use always* in Greene's study. The majority (> 75%) of respondents in the current study used all of these pain practices. A small number of respondents ( $n = 30$ , 5.3%) were unaware of the practice of pain assessment, and 5.9% ( $n = 33$ ) were unaware of scheduled pain medication, and 5.5% ( $n = 31$ ) were unaware of nonpharmacologic techniques as recommended pain management practices. The average level of awareness for all of these practices was 3.0 ( $SD=.86$ ), which indicated the *use sometimes* level of adoption

of practices for pain management. The most common source for information for pain assessment ( $n = 420$ , 78.8%), scheduled pain medication ( $n = 436$ , 81.3%), and nonpharmacologic techniques ( $n = 484$ , 90.6%) was professional literature.

### Fatigue as a Problem

As seen in Table 6, 60.7% ( $n=326$ ) of respondents reported that fatigue was a very significant problem. The majority reported it was very important to improve fatigue management ( $n=438$ , 81.7%). Thirty-five percent ( $n=187$ ) of participants reported that the practice was doing a good to excellent job of managing fatigue.

### Awareness and Use of the Fatigue Guideline

The level of adoption of the fatigue guidelines was determined using the scoring system developed by Greene (1997). A composite score to determine adoption was obtained (range of 0 to 4). As seen in Table 7, 51.5% ( $n = 265$ ) of participants were unaware of the fatigue guidelines. The average level of adoption of the fatigue guidelines was 1.3 ( $SD=1.5$ ), which indicates the respondents were at the awareness level of adoption of the fatigue guidelines.

### Adoption of Three Fatigue Management Practices

The level of adoption of three specific nursing practices for management of fatigue (assessment, exercise, and nonpharmacologic techniques) was determined by aggregation of four questions for each specific practice. The scoring system was that developed by Brett (1987) and utilized by Greene (1997)

and Rutledge et al. (1996). Table 7 reports results of the current study and Rutledge and illustrates that, for the current study, small percentages of respondents were unaware of the recommended fatigue management practices of assessment ( $n = 32$ , 5.7%), exercise ( $n = 44$ , 7.8%), and nonpharmacologic techniques ( $n = 53$ , 9.4%). The average level of awareness for all these practices was 2.7 ( $SD=.96$ ), which indicated the *use sometimes* level of adoption of practices for fatigue management. The average level of adoption of the fatigue practices was 2.6, indicating the *use sometimes* level of adoption. The most common source for information for fatigue assessment ( $n = 412$ , 77.2%), exercise ( $n = 430$ , 80.7%), and nonpharmacologic techniques ( $n = 392$ , 73.5%) was professional literature.

#### Adoption of Pain Versus Fatigue Guidelines

A paired *t*-test was used to evaluate the difference between the respondents' levels of adoption of the pain and fatigue guidelines. A significance level of .05 was used. Of the respondents, 22.9% ( $n=114$ ) reported that they always followed the pain guidelines (Table 5) versus 12.0% ( $n=62$ ) who reported they always followed the fatigue guidelines (Table 7). This study indicated that the respondents' pain guideline adoption score was 1.9 ( $SD=1.6$ ) or at the *persuaded* level of adoption (Table 5), and the fatigue guideline adoption score was 1.3 ( $SD=1.5$ ) or at the *aware* level of adoption (Table 7). The average level of adoption of the pain guidelines was significantly higher than the average level of adoption of the fatigue guidelines ( $p < .001$ ) (Table 8).

### Adoption of Guidelines Compared to Previous Studies

One sample *t*-tests with a significance level of .05 were used to compare adoption scores of the current study to results of Greene (1997) and Rutledge et al. (1996). As shown in Table 5, this study indicated an improvement in mean scores representing the level of adoption of pain guidelines ( $p = < .001$ ), the practice of pain assessment ( $p = < .001$ ), and the use of nonpharmacologic techniques for pain ( $p = < .001$ ) with the current study compared to Greene. However, there was a decrease in the mean score for level of adoption for scheduled pain medication ( $p = < .001$ ).

There was a change from outpatient oncology nurses being *aware* of the pain guidelines with Greene's study, to being *persuaded* that they should be used in the current study. The pain practices of assessment and nonpharmacologic techniques for this study remain in the same diffusion category of *use sometimes* as the comparative studies (Greene, 1997; Rutledge et al., 1996). However, use of scheduled pain medication has declined from *use always* (Greene, 1997) to *use sometimes*. As shown in Table 7, this study indicated a decrease in the mean score for level of adoption for the practice of fatigue assessment compared to Rutledge et al. (1996) ( $p = .006$ ). However, the practice of fatigue assessment remains in the category of *use sometimes* as found by Rutledge and colleagues, and thus, the difference in adoption of fatigue assessment is not clinically significant.

### Adoption by Setting

This sample consisted of outpatient nurses who practiced in hospital clinics ( $n=390$ , 69.3%) and in office clinics ( $n=132$ , 23.4%) (Table 2). To test the effect of practice setting on adoption of the pain and fatigue guidelines, the data were separated according to setting (hospital or office) and the adoption scores were compared using separate paired  $t$ -tests. In this study, type of outpatient setting had no influence on adoption of pain guidelines ( $p=.17$ ) or fatigue guidelines ( $p=.27$ ). Setting did influence the practice of pain assessment ( $p<.001$ ) with a higher level of adoption in hospital clinics ( $M = 3.1$ ,  $SD=1.1$ ) compared to office clinics ( $M = 2.6$ ,  $SD=1.1$ ). However, there was no change in the adoption category, and thus, the difference in adoption of the practice of pain assessment by setting is not clinically significant.

### Adoption by Role

This sample consisted of staff nurses ( $n=316$ , 56.1%) and advanced practice nurses (APN) ( $n=131$ , 23.2%) (Table 2). To test the effect of role (APN or staff nurse) on pain and fatigue guideline adoption, the data were separated by role and level of adoption was evaluated with separate independent samples  $t$ -tests. The level of adoption score for pain guidelines was 2.6 for the APN and 1.7 for the staff nurses. The APNs were at the *use sometimes* category and the staff nurses were at the *persuaded* category of adoption. The APNs had higher pain guideline adoption scores compared to the staff nurses ( $p=.001$ ).

The level of adoption score for the fatigue guidelines was 1.7 for the APNs and 1.1 for the staff nurses. The APNs had higher fatigue guideline adoption scores compared to the staff nurses ( $p=.001$ ). The APNs were at the *persuaded* category and the staff nurses were at the *aware category* of adoption; thus, this difference is also clinically significant.

### Discussion

This study found that nurses do not report widespread use of evidence-based guidelines for cancer-related pain and fatigue. Specifically, the majority (53%) of over 500 oncology nurses in outpatient settings were persuaded of the usefulness of the pain guidelines, yet not using them. This study indicates little change in pain guideline adoption, and no change in use of the specific practices for pain and fatigue since the results of prior work (Greene, 1997; Rutledge et al., 1996).

Half of the outpatient oncology nurses in this study were unaware of the fatigue guidelines. While there were no previous adoption scores for fatigue guidelines available for comparison to these results, this study found the adoption level was at the lowest level (*aware*). In 14 years, there was no change in the level of adoption of the practice of fatigue assessment for nurses in this study compared to Rutledge et al. (1996), who reported that the fatigue assessment category was *use sometimes* (Table 7).

Stagnation at the *aware* level of adoption of fatigue guidelines, progression to only the *persuaded* stage of pain guideline adoption, and no



progression from *use sometimes* for the specific practices for both pain and fatigue appears to be, at best, a very slow movement towards actual guideline adoption. Reasons for this delay may relate to setting, nursing role, and the misunderstanding by nurses of symptom impact. The setting for the majority of nurses in this study was a hospital clinic ( $n=390$ , 69.3%) with 23.4% ( $n=132$ ) in an office clinic (Table 2) – a dramatic switch compared to that of Greene's (1997) large majority of participants in the office clinic ( $n=318$ , 89.6%). The change in location of the outpatient nurses from 1997 to 2010 is consistent with the reimbursement-driven movement of specialists from privately owned clinics to other settings such as hospital owned clinics (Liebhaber & Grossman, 2007; O'Malley, Bond, & Berenson, 2011).

The Joint Commission mandates pain management in many healthcare institutions, including hospital ambulatory care clinics (Fox & Gordon, 2002). Mandated policies, in addition to the potential for increased nurse exposure to continuing education activities through association with a hospital, may lead to the presumption of increased use of evidence-based practice. However, in the current study, the type of outpatient setting did not influence adoption of the pain or the fatigue guidelines.

Role was analyzed to evaluate the influence on pain and fatigue guideline adoption. There was a difference in adoption between the APNs and the staff nurses. The category of adoption of the pain guidelines for the APNs was *use sometimes*, whereas, the staff nurses were at the *persuaded* level of adoption for the pain guidelines. Likewise, there was a difference in the category of fatigue

guideline adoption with the APNs at the *persuaded* level and the staff nurses at the *aware* level. This category difference in pain and fatigue guideline adoption by the APNs compared to the staff nurses is clinically significant and indicates that the APNs are more advanced in recognizing the advantages of evidence-based guidelines.

Outpatient nurses may not discuss pain medication with patients if they believe they do not have the authority to treat pain. It is within the scope of practice of the staff nurse to discuss pain levels and current medication use along with nonpharmacologic pain reduction strategies. If the patient reports pain, or reports using breakthrough pain medication on a regular schedule at the maximum dose, it is not only within the nursing scope of practice, but a nursing obligation to bring the issue to the physician.

The majority of the nurses reported that it was very important to improve patients' pain management ( $n=486$ , 87.3%) (Table 4) and fatigue management ( $n=438$ , 81.7%) (Table 6). Most ( $n=348$ , 64.8%) of the nurses reported that their facility did a good job managing pain (Table 4), yet only 35.0% ( $n=187$ ) believed they did a good or excellent job managing fatigue (Table 6).

The nurses reported that 66.1% ( $SD=23.0$ ) of their patients had moderate to severe fatigue. However, the nurses reported that only 37.8% ( $SD=22.5$ ) of their cancer patients had moderate to severe pain despite abundant evidence of the high levels of pain in cancer patients treated in the outpatient setting (Deandrea, Montanari, Moja, & Apolone, 2008). It is possible that these facilities have improved pain management since the studies included in the meta-analysis

by Deandrea and colleagues. However, it is also possible that provider pain estimates do not reflect patient estimates of their pain (Grossman, Sheidler, Swedeen, Mucenski, & Piantadosi, 1991).

### Guidelines Versus Individual Practices

The reason for the lack of outpatient oncology nurse awareness of the pain and fatigue guidelines may be dissemination issues, but the findings of this study indicate that while nurses were not using the guidelines, they were sometimes using the individual practices recommended by the guidelines. Nurses are knowledgeable and sometimes use the pain and fatigue guideline recommended practices but do not associate them with any particular guideline.

### Nursing Implications

Evidence-based practice is a process that uses research results to establish practice guidelines for the best management of healthcare problems. These guidelines contain evidence-based clinical practice recommendations to positively affect patient outcomes. However, even for guidelines that have a long history of development and dissemination such as those for pain and fatigue, many ambulatory care oncology nurses are not persuaded that the guidelines are useful, and are only sometimes utilizing the practices recommended by the guidelines. The most important aspect of the guidelines is the evidence-based practice recommendations found within them. Researchers need to test strategies to encourage nurse adoption of these practice recommendations. Solitary strategies to promote adoption of guidelines and recommendations, such

as dissemination and education, have been unsuccessful in promoting change (Davis, Thomson, Oxman, & Haynes, 1995; Freemantle et al., 2005; Grimshaw et al., 2001). Measures that were effective to promote practice change involved chart audits with feedback that was timely, task-oriented, nonpunitive, and discussed consequences of compliance/noncompliance on patient outcomes (Davis et al., 1999; Hysong, Best, & Pugh, 2006).

As found with this study, APN education and continuing education have created nurses who are more aware of the evidence behind practices and of how to access resources for this information. The findings of this study indicate that staff nurses do not link practices to the respective guidelines. This gap could be bridged by inclusion of the evidence behind practices across the continuum of nursing education from baccalaureate programs and continuing education programs to facility in-services. Educational articles and professional presentations at seminars and conferences could link the evidence to the particular practices under discussion. Outpatient facilities could provide resources for access to evidence such as computers, journal clubs, or discussion groups, and provide time and incentives for the evidence-based practice process (Pravikoff, Pierce, & Tanner, 2003). Facilities could utilize APNs as role models for staff nurses in the clinical setting, a strategy shown to be effective with encouraging guideline adoption (Berwick, 2003). These measures would encourage staff nurse hardwiring of evidence-based practice and ultimately have a positive effect on patient outcomes.

### Conclusion

Evidence-based guidelines provide a concise and efficient means for nurses to obtain evidence-based practice recommendations needed to give patients the best possible care. Findings from this study indicate that many ambulatory care oncology nurses did not use pain and fatigue guidelines. However, even when they are not aware of the guidelines themselves, the majority of the nurses did sometimes use the specific practices recommended in both the pain and the fatigue guidelines. This study provided baseline data regarding the adoption of pain and fatigue guidelines, thus paving the way for interventional studies on how to best facilitate adoption of clinical practice guidelines, and more importantly the practice recommendations they contain.

### References

- Aiello-Laws, L., Reynolds, J., Deizer, N., Peterson, M., Ameringer, S., & Bakitas, M. (2009). Putting evidence into practice: What are the pharmacologic interventions for nociceptive and neuropathic cancer pain in adults? *Clinical Journal of Oncology Nursing*, 13(6), 649-655.  
doi:10.1188/09.CJON.649-655
- American Academy of Hospice and Palliative Medicine. (2007). *U.S. clinical practice guidelines for quality palliative care, The National Consensus Project 2007*. Retrieved from <http://www.aahpm.org>
- American Academy of Pain Medicine. (1998). Acute pain and cancer pain. *A position statement from the American Academy of Pain Medicine*. Retrieved from <http://www.painmed.org/Workarea/DownloadAsset.aspx?id=3272>
- American Pain Society Quality of Care Committee. (1995). Quality improvement guidelines for the treatment of acute pain and cancer. *Journal of the American Medical Association*, 274(23), 1874-1880.
- American Society of Anesthesiologists. (1996). Practice guidelines for cancer pain management. *Anesthesiology*, 84, 1243-1257.
- Borneman, T., Piper, B. F., Sun, V. C., Koczywas, M., Uman, G., & Ferrell, B. (2007). Implementing the fatigue guidelines at one NCCN member institution: Process and outcomes. *Journal of the Comprehensive Cancer Network*, 5(10), 1092-1011.
- Brett, J. L. (1987). Use of nursing practice research findings. *Nursing Research*, 36(6), 344-349.
- Curt, G.A. (2000). The impact of fatigue on patients with cancer: Overview of FATIGUE 1 and 2. *The Oncologist*, 5(Suppl 2), 9-12.  
doi:10.1634%2Ftheoncologist.5-suppl\_2-9
- Davis, D. A., O'Brien, M. A., Freemantle, N., Wolf, F.M., Mazmapian, P., & Taylor-Vaisey, A. (1999). Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *Journal of the American Medical Association*, 282(9), 867-874.  
doi:10.1001/jama.282.9.867

- Davis, D.A., Thomson, M.A., Oxman, A.D., & Haynes, R. B. (1995). Changing physician performance. A systematic review of the effect of continuing medical education strategies. *Journal of the American Medical Association*, 274(9), 700-705. doi:10.1001/jama.282.9.867
- Deandrea, S., Montanari, M., Moja, L., & Apolone, G. (2008). Prevalence of undertreatment in cancer pain. A review of published literature. *Annals of Oncology*, 19(12), 1985-1991.
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2<sup>nd</sup> ed.). Hoboken, NJ: John Wiley & Sons.
- Fox, C. D., & Gordon, D. B. (2002). Joint Commission pain standards: A progress report. *American Pain Society Bulletin*, 12(6). Retrieved from <http://www.ampainsoc.org/library/bulletin/nov02/poli1.htm?print=t>
- Freemantle, N., Harvey, E. L., Wolf, F., Grimshaw, J. M., Grilli, R., & Bero, L. A. (2005). Printed educational materials: Effects on professional practice and health care outcomes. *The Cochrane Database Systematic Review*, 3. doi:10.1002/14651858.CD000172
- Given, B., Given, C. W., McCorkle, R., Kozachik, S.K., Cimprich, B., Rahbar, M. H., & Wojcik, C. (2002). Pain and fatigue management: Results of a nursing randomized clinical trial. *Oncology Nursing Forum* 29(6), 949-956. doi:10.1188/02.ONF.949-956
- Gordon, D. B., Dahl, J. L., Miaskowski, C., McCarberg, B., Todd, K. H., Paice, J. A., & Carr, D. B. (2005). American Pain Society recommendations for improving the quality of acute and cancer pain management. *Archives of Internal Medicine*, 165(14), 1574-1580. doi:10.1001/archinte.165.14.1574
- Grant, M., Golant, M., Rivera, L., Dean, G., & Benjamin, H. (2000). Developing a community program on cancer pain and fatigue. *Cancer Practice*, 8(4), 187-194. doi:10.1046/j.1523-5394.2000.84012.x
- Greene, P. E. (1997). *Diffusion of innovations in cancer pain management and barriers to changing practice: A study of office practice oncology nurses* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations (Publication No. AAT9812155).
- Grimshaw, J. W., Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., ... O'Brien, M. A. (2001). Changing provider behavior: An overview of systematic reviews of interventions. *Medical Care*, 39(8 Suppl 2), I12-145.

- Grossman, S. A., Sheidler, V. R., Swedeen, L., Mucenski, J., & Piantadosi, S. (1991). Correlation of patient and caregiver ratings of cancer pain. *Journal of Pain and Symptom Management*, 6(2), 53-57. doi:10.1016/0885-3924(91)90518-9
- Hysong, S. J., Best, R. G., & Pugh, J. A. (2006). Audit and feedback and clinical practice guideline adherence: Making feedback actionable. *Implementation Science*, 1(9). doi:10.1186/1748-5908-1-9
- Innis, J., Bikaunieks, N., Petryshen, P., Zellermyer, V., & Ciccarelli, L. (2004). Patient satisfaction and pain management: An educational approach. *Journal of Nursing Care Quality*, 19(4), 322-327. doi:10.1097%2F00001786-200410000-00006
- Jacox, A., Carr, D. B., & Payne, R. (1994). New clinical-practice guidelines for the management of pain in patients with cancer. *New England Journal of Medicine*, 330, 651-655. doi:10.1056%2FNEJM199403033300926
- Liebhaber, A., & Grossman, J. M. (2007). Physicians moving to mid-sized, single-specialty practices. *Tracking Report*, 18, 1-5. <http://www.hschange.com/CONTENT/941/941.pdf>
- McDonald, L. (2001). Florence Nightingale and the early origins of evidence-based nursing. *Evidence Based Nursing*, 4(3), 68-69. doi:10.1136/ebn.4.3.68
- Mitchell, S., Beck, S., Hood, L., Moore, K., & Tanner, E. (2007). Putting evidence into practice: Evidence-based interventions for fatigue during and following cancer and its treatment. *Clinical Journal of Oncology Nursing*, 11(1), 99-113. doi:10.1188/07.CJON.99-113
- Mock, V. (2001). Fatigue management: Evidence and guidelines for practice. *Cancer*, 92(Suppl 6), 1699-1707. doi:10.1002/1097-0142(20010915)92:6+<1699::AID-CNCR1500>3.0.CO;2-9
- Mock, V., Atkinson, A., Barsevick, A., Cella, D., Cimprich, B., Cleeland, C., & Stahl, C. (2000). NCCN practice guidelines for cancer-related fatigue. *Oncology*, 14(11A), 151-161.
- National Comprehensive Cancer Network. (2009, January 15). *NCCN practice guidelines in oncology -- v.1.2008*. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/PDF/fatigue.pdf](http://www.nccn.org/professionals/physician_gls/PDF/fatigue.pdf)



- National Comprehensive Cancer Network. (2011, July 22). *NCCN practice guidelines in oncology -- v.2.2011*. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/PDF/pain.pdf](http://www.nccn.org/professionals/physician_gls/PDF/pain.pdf)
- Oliver, J. W., Kravitz, R. L., Kaplan, S. H., & Meyers, F. J. (2001). Individualized patient education and coaching to improve pain control among cancer outpatients. *Journal of Clinical Oncology*, 19(7), 2206-2212.
- O'Malley, A. S., Bond, A. M., & Berenson, R. A. (2011). Rising hospital employment of physicians: Better quality, higher costs? *Center for Studying Health System Change*, 136, 1-4.
- Oncology Nursing Society. (2006). *Cancer pain management: Oncology Nursing Society position on cancer pain management*. Retrieved from <http://www.ons.org/publications/positions/CancerPainManagement.shtml>
- Oncology Nursing Society. (2008). *Evidence based practice resource area*. Retrieved from [http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines\\_pain.pdf](http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines_pain.pdf)
- Passik, S. D., & Kirsh, K. L. (2005). A pilot examination of the impact of cancer patients' fatigue on their spousal caregivers. *Palliative and Supportive Care* 3(4), 273-279. doi:10.1017/S1478951505050431
- Pravikoff, D. S., Pierce, S., & Tanner, A. (2003). Are nurses ready for evidence-based practice? *American Journal of Nursing*, 103(5), 95-96. doi:10.1097/00000346-200305000-00029
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Free Press.
- Rutledge, D. N., Greene, P., Mooney, K., Nail, L. M., & Ropka, M. (1996). Use of research-based practices by oncology staff nurses. *Oncology Nursing Forum*, 23(8), 1235-1244.
- Sherwood, G. D., Adams-McNeill, J., Starck, P. L., Nieto, B., & Thompson, C. J. (2000). Qualitative assessment of hospitalized patients' satisfaction with pain management. *Research in Nursing & Health*, 23(6), 486-495. doi:10.1002/1098-240X(200012)23:6<486::AID-NUR7>3.3.CO;2-X
- Wells, N., McDowell, R., & Hendricks, P. (2007). Linking pain knowledge, assessment, management and patient outcome [Abstract]. *Oncology Nursing Forum*, 34(1), 170.

World Health Organization. (1986). *Cancer pain relief*. Geneva, Switzerland:  
World Health Organization.

Table 1  
Rogers' (1995) Stages of Adoption

Stage	Definition
Knowledge	The time at which the individual (or decision-making unit) first learns of an innovation
Persuasion	When a favorable or unfavorable attitude toward the innovation is formed following knowledge of the innovation; a decision is made following persuasion to either adopt or reject the innovation
Implementation	Use of the innovation
Confirmation	When the individual seeks reinforcement of a decision that has been made and reevaluates the decision to adopt; results in either continued adoption or discontinuance

Table 2

## Sample Demographics Compared with the Oncology Nursing Society

Demographic	ONS		Current Study		Greene (1997)	
Education:	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Diploma/Associate	8,836	37.1	127	23.9	168	48.0
Baccalaureate	10,182	42.7	241	45.3	152	43.4
Masters	4,449	18.6	154	28.9	29	8.3
Doctoral	378	1.6	10	1.9	1	0.3
Work Setting						
Physician's office	5,098	20.8	132	23.4	318	89.6
Hospital-based outpatient clinic	5,041	20.6	390	69.3	14	3.9
Other outpatient	2,472	10.1	41	7.3	23	6.5
Inpatient	9,427	38.5	0	0	0	0
Other	2,430	10.0	0	0	0	0
Direct Patient Care						
Staff Nurse	13,839	56.5	316	56.1	197	55.6
Nurse Practitioner	1,639	6.7	84	14.9	11	3.1
Clinical Nurse Specialist	946	3.9	47	8.4	37	10.5
Other	8,064	32.9	116	20.6	109	30.8
Oncology Certified	19,006	52.7	404	71.8	285	77

Note: ONS data are for all members with email address on file with the listserve

Table 3

## Survey Questions to Determine Pain and Fatigue Guideline Adoption

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\*1. Which of the following statements best describes your awareness of pain/fatigue management guidelines before you received this questionnaire (CHECK ONLY ONE)

- A. I had not heard or read about any pain/fatigue management guideline
- B. I knew about pain/fatigue management guideline(s) but did not know what it covered
- C. I knew about practice recommendations covered in the pain/fatigue guideline(s)
- D. Other: \_\_\_\_\_

\*2. Based on what you know about the pain/fatigue guidelines, have you used any of the recommendations in your practice? Which statement best describes your use of the guideline? (CHECK ONLY ONE)

- A. I don't know enough about the pain/fatigue guidelines to use them
  - B. I have not considered making any changes in my practice
  - C. I have decided to make changes, but have not actually made any yet
  - D. I have made changes in my practice that I use sometimes
  - E. I have made changes in my practice that I always use
  - F. Other \_\_\_\_\_
-

Table 3 Continued

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\*3. If you indicated that you had heard of pain/fatigue guidelines, please indicate which of these sources(s) informed you of them (check all that apply):

- A. I read about them in the newspaper
- B. I heard about them on the radio
- C. I saw a story about them on television
- D. I heard about them at a conference
- E. I read about them in a professional journal
- F. I heard about them from a drug company representative
- G. I heard about them over the internet
- H. Other: \_\_\_\_\_

\*4. Have you read a copy of a pain/fatigue guideline?

- A. No
- B. Yes

Question 5 for pain guidelines.

\*\*5. Please indicate if you have read each of the following guidelines (check all that apply):

- A. American Society of Pain Medicine
  - B. American Pain Society
  - C. National Comprehensive Cancer Network (NCCN)
  - D. Oncology Nursing Society (ONS)
  - E. Agency for Healthcare Research & Quality (AHRQ)
  - F. Other \_\_\_\_\_
-

Table 3 Continued

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Question 5 for fatigue guidelines.

**\*\*5.** Please indicate if you have read each of the following guidelines (check all that apply):

A. NCCN Cancer-Related Fatigue Guidelines

B. ONS Fatigue PEP Resources

C. Other:

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*Note:* For questions 1-4 pain or fatigue substituted in the blanks; question 5 is specific for either pain or fatigue.

Table 4

## Reported Significance of Pain as a Problem

Question	Answer	<i>n</i> (%)
Significance of cancer pain	Not at all significant	38 (6.9)
	Somewhat significant	256 (46.5)
	Fairly significant	109 (19.8)
	Very significant	148 (26.9)
Importance of improving pain	Not at all important	3 (0.5)
	Somewhat important	22 (3.9)
	Fairly important	46 (8.3)
	Very important	486 (87.3)
How well practice manages pain	Excellent	108 (20.1)
	Good	348 (64.8)
	Fair	79 (14.7)
	Poor	2 (0.4)



Table 5

## Level of Adoption of Cancer-Related Pain Guidelines by Oncology Nurses in Three Studies

Adoption Variable	LEVEL OF ADOPTION						<i>p</i>	Stage of Adoption	<i>n</i>
	Unaware <i>n</i> (%)	Aware <i>n</i> (%)	Persuaded <i>n</i> (%)	Use Sometimes <i>n</i> (%)	Use Always <i>n</i> (%)	Mean (SD)			
Pain guideline									
Current Study	160 (30.8)	77 (14.8)	39 (7.5)	130 (25.0)	114 (21.9)	1.9 (1.6)	<.001	Persuaded	520
Greene (1997)	171 (47.8)	56 (15.6)	5 (1.4)	90 (25.1)	36 (10.1)	1.3 (1.5)		Aware	358
Pain assessment									
Current Study	30 (5.3)	31 (5.5)	68 (12.1)	233 (41.4)	201 (35.7)	2.9 (1.2)	<.001	Use Sometimes	563
Greene (1997)	23 (6.4)	26 (7.2)	91 (25.4)	186 (51.8)	33 (9.2)	2.5 (1.0)		Use Sometimes	359
Rutledge et al. (1996)	121 (5)	95	91	39	48	3.3		Use Sometimes	1100
Scheduled pain med									
Current Study	33 (5.9)	15 (2.7)	37 (6.6)	215 (38.1)	263 (46.7)	3.2 (1.1)	<.001	Use Sometimes	563
Greene (1997)	7 (1.9)	5 (1.4)	5 (1.4)	121 (33.7)	221 (61.6)	3.5 (0.8)		Use Always	359

Table 5 continued.

Adoption Variable	LEVEL OF ADOPTION					Mean (SD)	p	Stage of Adoption	n
	Unaware n (%)	Aware n (%)	Persuaded n (%)	Use Sometimes n (%)	Use Always n (%)				
Pain nonpharm									
Current Study	31 (5.5)	24 (4.3)	57 (10.1)	360 (63.9)	91 (16.2)	2.8 (0.9)	<.001	Use Sometimes	563
Greene (1997)	22 (6.1)	32 (8.9)	57 (15.9)	213 (59.3)	35 (9.8)	2.6 (1.0)		Use Sometimes	359
Rutledge et al. (1996)	44 (4)	116 (10.5)	282 (25.6)	533 (48.5)	125 (11.4)	3.0 <sup>1</sup>	<.001	Use Sometimes	1100

Note: The possible range of level of adoption scores was 1-4; to interpret mean adoption scores, unaware = 0-0.49; aware = 0.5-1.49; persuaded = 1.5-2.49; use sometimes = 2.5-3.49; use always = 3.5-4; med = medications; nonpharm = nonpharmacologic.

<sup>1</sup>SD not available

Table 6

## Reported Significance of Fatigue as a Problem

Question	Answer	<i>n</i> (%)
Significance of cancer fatigue	Not at all significant	5 (.9)
	Somewhat significant	61 (11.4)
	Fairly significant	145 (27.0)
	Very significant	326 (60.7)
Importance of improving fatigue	Not at all important	1 (0.2)
	Somewhat important	27 (5.0)
	Fairly important	70 (13.1)
	Very important	438 (81.7)
How well practice manages fatigue	Excellent	14 (2.6)
	Good	173 (32.4)
	Fair	292 (54.7)
	Poor	55 (10.3)

Table 7

Level of Adoption of Cancer-Related Fatigue Guidelines and Specific Practices for two studies

Adoption Variable	LEVEL OF ADOPTION						<i>p</i>	Stage of Adoption	<i>n</i>
	Unaware <i>n</i> (%)	Aware <i>n</i> (%)	Persuaded <i>n</i> (%)	Sometimes <i>n</i> (%)	Always <i>n</i> (%)	Mean (SD)			
Fatigue guidelines									
Current study	265 (51.5)	47 (9.1)	49 (9.5)	92 (17.9)	62 (12.0)	1.3 (1.5)		Awareness	515
Fatigue assessment									
Current study	32 (5.7)	38 (6.7)	123 (21.9)	189 (33.6)	181 (32.1)	2.8 (1.3)	.006	Use sometimes	563
Rutledge et al. (1996)	517 (47)	81 (7.4)	144 (13.1)	281 (25.5)	77 (7)	2.9 <sup>1</sup>		Use sometimes	1100
Exercise for fatigue									
Current study	44 (7.8)	40 (7.1)	70 (12.5)	271 (48.1)	138 (24.5)	2.7 (1.3)		Use sometimes	563
Fatigue nonpharm									
Current study	53 (9.4)	57 (10.1)	68 (12.1)	316 (56.1)	69 (12.3)	2.5 (1.1)		Use sometimes	563

Note: The possible range of level of adoption scores was 1-4; to interpret mean adoption scores unaware=0-0.49;

aware=0.5-1.49; persuaded=1.5-2.49; use sometimes=2.5-3.49; use always=3.5-4.0; med = medications; nonpharm =

nonpharmacologic

<sup>1</sup>SD not available

Table 8

## Level of Adoption of Pain Versus Fatigue Guidelines

Level of adoption	<i>n</i>	Mean ( <i>SD</i> )	Paired differences				<i>t</i>	<i>df</i>	Sig. (2 tailed)
			Mean ( <i>SD</i> )	Std. error mean	95% confidence interval of the difference				
					Lower	Upper			
Pain	500	1.9 (1.6)	.69 (1.7)	.08	.54	.84	9.0	499	<.001
vs.									
Fatigue	500	1.3 (1.5)							

## CHAPTER 3

# FACTORS AFFECTING ADOPTION BY OUTPATIENT ONCOLOGY NURSES OF PAIN AND FATIGUE GUIDELINES

Prepared for submission to *Oncology Nursing Forum*

### Abstract

**Purpose/Objectives:** To determine organizational and nursing characteristics and perceptions that affects adoption by outpatient oncology nurses of clinical practice guidelines for cancer-related pain and fatigue and to examine the relationships between these factors and the level of guideline adoption.

**Design:** Correlational descriptive research design with online survey method.

**Setting:** United States outpatient oncology clinics.

**Sample:** 8,100 direct patient care outpatient oncology nurse members of the Oncology Nursing Society in the U.S. with email addresses; 563 with useable data.

**Methods:** Measures were a brief demographic survey, the Research Utilization in Nursing, and the Perceived Characteristics of Innovating questionnaires.

**Main research variables** were pain/fatigue guideline adoption with the predictors of characteristics of the nurse (change agency, cosmopolitaness, opinion leadership, experience, education, certification, and perceptions of pain/fatigue guidelines) and organization (size, climate for change, context, and policies supporting pain/fatigue practices).

**Findings:** Multiple regression analyses indicated that nursing experience, education, organizations' climate for change, policies, and perceptions of the guidelines influenced both pain and fatigue guideline adoption. Opinion

leadership and context influenced pain guideline adoption. Cosmopolitaness influenced fatigue guideline adoption. Greater than 21% of the variance was accounted for with both the models for pain and fatigue guideline adoption.

Conclusions: Nurses who are more experienced and educated and opinion leaders influenced adoption of pain/fatigue guidelines that were viewed as reliable and needed within the organization.

Implications for Nursing: Research is needed to find effective ways to incorporate experienced nurses and advanced practice nurses into oncology clinic settings and to expose clinic nurses to outside contacts. Administrators can encourage continuing education and contacts outside of clinic facilities.

### Introduction and Background

Nurses strive to provide patients with optimal care. Evidence-based practice is a process used to evaluate research findings to determine the safest and best practices and can result in clinical practice guidelines. Guidelines are systematically derived statements to assist healthcare provider decisions about appropriate patient care in a particular situation (Field & Lohr, 2001). Health care organizations have established and disseminated guidelines. However, insufficient use of these guidelines persists (Ayello, Baronoski, & Salati, 2005; Greene, 1997; Hollen, Hollen, & Stolte, 2000; Idell, Grant, & Kirk, 2007; Kirchhoff, 2004; Mahon, Williams, & Spies, 2000; Martin & Larson, 2003; McGuire, Johnson, & Migliorati, 2006; Rutledge, Greene, Mooney, Nail, & Ropka, 1996).

Evidence-based guidelines have been established and disseminated for both cancer-related pain and fatigue (American Academy of Hospice and



Palliative Medicine, 2007; American Geriatric Society, 2009; American Pain Society Quality of Care Committee, 1995; American Society of Anesthesiologists, 1996; Herr et al., 2002; Jacox, Carr, & Payne, 1994; Miaskowski et al., 2005; Mitchell, Beck, Hood, Moore, & Tanner, 2007; Mock, 2001; Mock et al., 2000; National Comprehensive Cancer Network [NCCN], 2011; Oncology Nursing Society, 2008; Winningham et al., 1994; World Health Organization, 1986). Despite dissemination of these guidelines to nurses, maximal guideline adoption has not occurred (Greene, 1997; Rutledge et al., 1996). Organizational influences and individual nurse characteristics and perceptions may be influencing guideline adoption. Investigation into factors that may enhance or hinder guideline adoption may assist development of strategies to promote timely adoption.

The purpose of this study was to determine if organizational characteristics and individual nurse characteristics and perceptions of cancer-related pain and fatigue guidelines were factors that influenced their adoption by outpatient oncology nurses.

### Theoretical Framework

Rogers' diffusion of innovations theory guided this research. Rogers (1995) defined an innovation as something that is seen by an individual or organization as new, such as clinical practice guidelines. As defined by Rogers, diffusion of innovation among individuals is a social process that follows a five-step adoption process. As it pertains to guidelines, awareness occurs when the individual has knowledge of the guideline, persuaded means they are convinced

use of the guideline is appropriate, next they decide to use the guideline, implementation is actual use of the guideline, and confirmation is an evaluation that occurs with the decision to either adopt or reject the guideline. Influences on the rate of progression through this process arise from the organization, individuals within the organization, and the innovation itself.

Organizational characteristics that may affect the nurse's level of adoption of practice guidelines include the organization's attitude towards change as it is exhibited through the mission statement and actions (climate for change), degree that the organization opposes change (resistance to change), goals and philosophy of the organization (context), and existence of policies supporting the change (Rogers, 1995). Individuals who are quick to adopt are influential change agents in their practice (*change agency*), have relatively large amounts of informal influence on others (*opinion leadership*), and are relatively open and exposed to knowledge resources outside the workplace (*cosmopoliteness*) (Rogers, 1995).

Rogers (1995) identified attributes of the innovation that influence adoption. An innovation more likely to be adopted has an advantage over the idea or practice it is replacing. It is compatible with the values, experiences, and needs of the adopter, offers ease of application, and results in observable positive outcomes. The more of these characteristics the innovation possesses, the more quickly the adopter will move from knowledge of the innovation to adoption or use.

The form of an innovation is its directly observable physical appearance and substance. Function is the effect of the innovation on the adopter. Rogers (1995) stressed the importance of understanding not only the form and function of an innovation, but also its meaning, which is the subjective and often unconscious perception of an innovation by the adopter. The meaning, or perception of an innovation, is the most resistant to diffusion because of this subjective nature. Understanding the adopter's perception of the innovation is thus a crucial element to understanding its diffusion. Moore and Benbasat (1991) stated that rather than the innovation itself, it is the adopter's perceptions of *using* the innovation that determine whether the innovation is adopted. For example, it may not be the guideline itself that influences nurses' behavior, but their perceived usefulness of the guideline.

### Design and Sample

A correlational descriptive research design with survey methods was used. An online survey was utilized. This survey assessed existing organizational characteristics of outpatient oncology clinics, evaluated nurses' perceptions of clinical practice guidelines for cancer-related pain and fatigue, and examined relationships between selected factors and the level of adoption of the pain and fatigue guidelines.

The population consisted of 36,066 nurse members of the Oncology Nursing Society (ONS) (Oncology Nursing Society, 2010). The sample was 8,000 individuals who were nurses working in direct patient care in outpatient settings in the United States who had email addresses on file with ONS, plus 100

members who also had mailing addresses (total of 8,100). Of the 781 who completed the survey, 563 gave useable data.

Participants were predominately female ( $n=518$ , 97.7%) with an average age of 47.9 ( $SD=9.8$ ) years. They had been practicing as nurses for an average of 22 ( $SD=10.5$ ) years, and as oncology nurses for 14.5 ( $SD=9.0$ ) years. Table 9 lists demographics for the current study, ONS, and Greene (1997), and reports that, for the current study, the most common education level of participants was baccalaureate ( $n=241$ , 45.3%), followed by master's ( $n=154$ , 28.9%), diploma/associate ( $n=127$ , 23.9%), and doctoral ( $n=10$ , 1.9%). The majority of the nurses ( $n=390$ , 69.3%) worked in hospital outpatient clinics, 24% ( $n=132$ ) worked in office clinics, and 7.3% ( $n=41$ ) in other settings (both hospital and office clinics, hospice, or radiation clinics). Most nurses ( $n=316$ , 56.1%) were staff nurses, while 8.4% ( $n=47$ ) were clinical nurse specialists, 14.9% ( $n=84$ ) were nurse practitioners, and 20.6% ( $n=116$ ) were in other roles. Seventy-two percent ( $n=404$ ) of participants were oncology certified. This sample was similar to the ONS membership except more in the current sample ( $n=404$ , 71.8%) compared to ONS ( $n=19,006$ , 52.7%) were oncology certified ( $p<.001$ ), more of the nurses in this study ( $n=390$ , 69.3%) compared to ONS ( $n=5,041$ , 20.6%) worked in hospital clinics ( $p<.001$ ), and fewer in the current study ( $n=132$ , 23.4%) compared to ONS ( $n=5,098$ , 20.8%) worked in physicians' offices ( $p<.001$ ).

### Measures

Demographic data of the nurses and the organizations were collected. Also collected was information about characteristics of the nurses and organizations. The measures used were the Research Utilization in Nursing (Greene, 1997) and the Perceived Characteristics of Innovating (Moore & Benbasat, 1991) questionnaires.

#### Demographic and Clinical Profiles

Nurse and practice setting characteristics were measured using a questionnaire developed to elicit specific demographic and clinical variables. These questions elicited information about the practice setting, the nurse's role, hours worked, and time in direct patient care. These questions allowed testing of the demographic variables as influencing factors of adoption.

#### Research Utilization in Nursing

The Research Utilization in Nursing (RU-N) questionnaire was developed by Crane, Horsley, Stewart, and Shepherd (1990) to test research utilization by inpatient nurses and modified by Greene (1997) to reflect research utilization by nurses in the outpatient setting. Six subscales (39 items) measured variables that may affect the level of adoption of practice guidelines. Two subscales measured variables pertaining to nurses: cosmopolitaness (three items) and opinion leadership (four items). Four subscales measured variables pertaining to the office practice setting: climate for change (seven items), resistance to change (seven items), context (five items), and sources of information (13 items). With

these 39 items, plus one question developed by Greene that measured change agency, the RU-N consisted of a total of 40 items. Two items added to the question on sources of information were added for the current study (the National Comprehensive Cancer Network and the Internet), making the RU-N for the current study a total of 42 items.

Subscale reliability for the current study for the RU-N were: *opinion leadership* ( $\alpha = .85$ ), *climate for change* ( $\alpha = .91$ ), *resistance to change* ( $\alpha = .87$ ), *context* ( $\alpha = .71$ ), and *sources of information* ( $\alpha = .87$ ). Less than desirable reliability was found for *cosmopolitaness* ( $\alpha = .67$ ). These results were consistent with Greene's (1997) findings of internal consistency for all constructs ( $\alpha = 0.82$  to  $.91$ ), except for the cosmopolitaness scale ( $\alpha = .66$ ).

#### Perceived Characteristics of Innovating

Moore and Benbasat (1991) developed the Perceived Characteristics of Innovating (PCI) questionnaire as a general scale to measure a variety of innovations. Item development was based on the five characteristics of innovations (*relative advantage, compatibility, complexity, observability, trialability*) derived from Rogers (1995). The rigorous instrument development process followed by Moore and Benbasat resulted in the further division of some of Rogers' characteristics that resulted in the eight constructs; they subsequently dropped the construct of *trialability*. The final seven constructs included: voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, and visibility.

*Voluntariness* is defined as the degree use of the innovation is seen as of free will. *Relative advantage* is the degree the innovation is seen as better than its precursor. *Compatibility* is the degree the innovation is seen as consistent with existing values, needs, and past experiences. *Image* is the degree the innovation is thought to enhance image or social status. *Ease of use* is the degree the innovation is seen as free of physical and mental effort. *Result demonstrability* is the degree to which there are obvious results from using the innovation. *Visibility* is the degree to which the innovation is observable or able to be seen.

Moore and Benbasat's (1991) instrument development process resulted in seven subscales with a total of 23 items: voluntariness (two items), relative advantage (five items), compatibility (three items), image (three items), ease of use (four items), result demonstrability (four items), and visibility (two items). Moore and Benbasat obtained the following internal consistency: relative advantage ( $\alpha = .90$ ), compatibility ( $\alpha = .86$ ), ease of use ( $\alpha = .84$ ), result demonstrability ( $\alpha = .79$ ), image ( $\alpha = .79$ ), visibility ( $\alpha = .83$ ), and voluntariness ( $\alpha = .82$ ). The current study found that alpha coefficients for the seven subscales of the Perceived Characteristics of Innovating subscales were internally consistent for most constructs for the both the pain ( $\alpha = .72$  to  $.94$ ) and fatigue guidelines ( $\alpha = .89$  to  $.97$ ). Coefficients for result demonstrability ( $\alpha = .70$ ) and visibility of fatigue guidelines ( $\alpha = .62$ ) were lower than reliabilities of Moore and Benbasat.

### Procedures

A Web survey was developed with Dillman (2007) as a guide. Participants were contacted by email on three occasions (prenotice, invitation, and reminder). The invitation and reminder emails contained a link to the Web survey. Participants consented to survey participation by following the link to the Web survey. A \$5.00 gift certificate was included as incentive. The questionnaire measured oncology nurse adoption of cancer-related pain and fatigue guidelines as previously reported. The measures evaluated in this study included characteristics of the nurse and organization, perceived characteristics of the pain and fatigue guidelines, and individual nurse demographic information. The university Institutional Review Board provided approval for this study.

### Data Analyses

#### Characteristics of the Nurse and Organization

Described in Table 10 are the following nurse and organization characteristics and how they were measured: cosmopolitaness, opinion leadership, climate for change, resistance to change, context, and sources of information used to solve clinical problems. Additional characteristics assessed with a single item include: change agency, nursing experience, education, certification, size, and policies.

#### Factors Influencing Adoption

Multiple regression using the backward method was used to determine the influence that organizational characteristics, nurse characteristics, and perceptions of the guidelines had on the level of adoption. Two separate



analyses were performed, one with the dependent variable of *adoption of pain guidelines* and another with *adoption of fatigue guidelines*. The nurse characteristics (change agency, cosmopoliteness, opinion leadership, nursing experience, oncology nursing experience, education, and certification), organization characteristics (size, climate for change, resistance to change, context, and policies supporting nursing practices), and perceptions of using the guidelines were the independent variables in the analysis. The influence of outpatient setting type (office clinic or hospital clinic) on adoption was evaluated by separating the data by setting and repeating the multiple regression analysis described previously. The data were separated by role (staff nurse or APN) and the multiple regression analysis previously described was repeated to evaluate the influence of the nursing role on the level of adoption.

## Results

### Characteristics of the Nurse and Organization

Most nurses ( $n=471$ , 88.4%) reported they had some degree of responsibility for implementing change (*change agency*) in their practice, although 11.6% ( $n=62$ ) thought they were not responsible for implementing change. As shown in Table 11, the mean score for the item measuring *change agency* was 2.6 ( $SD=.9$ ) (range of 1 to 4), indicating above average level of responsibility for implementing change. The mean score for *cosmopoliteness* was 2.2 ( $SD=1.3$ ) (range of 0 to 5+), which indicates that the majority of nurses used fewer than three outside sources of knowledge. *Opinion leadership*

averaged 3.4 ( $SD=.7$ ) with possible score of 1 (not at all) to 4 (very often), indicating that on average, participants were informal leaders at their facilities.

The average number of nurses working daily at facilities was four ( $SD = 1.4$ ). The average *climate for change* score was 3.5 (range 1 to 5), indicating a positive tendency for change. The *resistance to change* scores averaged 3.4 (range 1 to 6), reflecting slight resistance to implementing change. Mean *context* score was 4.0 (range 1 to 6), indicating above average agreement that their organizations had philosophies and goals supporting guidelines.

### Perceptions of Guidelines

Overall perceptions of pain and fatigue guidelines were similar. As demonstrated in Table 12, the three highest mean perception scores for pain guidelines were *relative advantage* ( $M=4.8$ ,  $SD=.9$ ), *compatibility* ( $M=4.8$ ,  $SD=.9$ ), and *ease of use* ( $M=4.7$ ,  $SD=.9$ ). The overall perception of the pain guidelines was 3.9 ( $SD=.5$ ). Similarly, the three highest mean perception scores for the fatigue guidelines were *relative advantage* ( $M=4.2$ ,  $SD=1.1$ ), *compatibility* ( $M=4.5$ ,  $SD=1.0$ ), and *ease of use* ( $M=4.2$ ,  $SD=1.1$ ). Overall perceptions of the fatigue guidelines was 3.9 ( $SD=.6$ ) (range of 1 to 6), indicating that the respondents had more favorable perceptions of using the fatigue guidelines.

### Factors Influencing Adoption

The final regression models accounted for over 20% of the variance in guideline adoption for both pain (21.4%) and fatigue (21.1%). The final pain regression model consisted of seven predictor variables: *opinion leadership*,

*nursing experience, education, climate for change, context, policies supporting nursing practice, and perceptions of pain guidelines*,  $F_{7,507} = 20.77, p < .001$ . As seen in Table 13, *policies supporting change* was the variable that exerted the most influence and *context* had a negative influence on pain guideline adoption. These results indicate that nurses with a more positive perception of using the pain guideline, who were opinion leaders, with more experience and education, and nurses who reported their organizations exhibited a climate for change and had policies in place that support nursing practice, were more likely to adopt the pain guidelines. Consistent with Greene (1997), the current study also indicated that nurses reporting their organization had clear values and goals supporting change (*context*) were less likely to adopt the guideline.

The final fatigue regression model consisted of six predictor variables: *cosmopolitaness, nursing experience, education, climate for change, policies supporting practice, and perceptions of the fatigue guidelines* ( $F_{6,501}=23.326, p<.001$ ). As seen in Table 14, *policies supporting practice* was the variable that exerted the most influence in fatigue guideline adoption, similar to what was found with pain guideline adoption. These results indicate that nurses with a more positive perception of using the fatigue guidelines, who were more cosmopolite, with more nursing experience and education, and who reported that the organization where they worked exhibited a climate for change and had policies in place supporting the practice were more likely to adopt fatigue guidelines.

In the office clinic setting, nurse characteristics (opinion leadership, experience, and perceptions) and organization characteristics (resistance to change and policies) accounted for 19% of the variance in pain guideline adoption ( $F_{5,122}=6.828, p<.001$ ). As seen in Table 15, *policies supporting practice* exerted the strongest influence, with *resistance to change* having a strong negative influence on pain guideline adoption in the office clinics. In the hospital clinic setting, nurse characteristics (opinion leadership, experience, education, and perceptions) and organization characteristics (climate for change, context, and policies supporting practice) accounted for 24.0% of the variance in pain guideline adoption ( $F_{7,346}=16.60, p<.001$ ). As seen in Table 15, *policies supporting practice* and *education* exerted the strongest influence, with *context* exhibiting a strong negative influence on pain guideline adoption in the hospital clinics. These results indicate characteristics that influence pain guideline adoption are unique to the particular outpatient setting. *Education*, *climate for change*, and *context* are characteristics that influenced pain guideline adoption in the hospital clinic only. *Resistance to change* influenced pain guideline adoption in the office clinic setting only.

In the office clinic setting, nurse characteristics (experience, education, and perceptions) and organization characteristics (context, and policies) accounted for 25.8% of the variance in fatigue guideline adoption ( $F_{5,115}=9.358, p<.001$ ). As seen in Table 15, *policies supporting practice* and *nursing experience* were the factors that had the strongest influence on fatigue guideline adoption in the office clinics. In the hospital clinic settings, nurse

characteristics (cosmopolitanism, opinion leadership, experience, education, and perceptions) and organization characteristics (climate for change, and policies) accounted for 21.4% in fatigue guideline adoption ( $F_{7,333}=14.209, p<.001$ ).

As seen in Table 15, *policies supporting practice* (27.0%) exerted the strongest influence on fatigue guideline adoption in the hospital settings. These results indicate characteristics that influence fatigue guideline adoption are unique to the particular outpatient setting. *Cosmopolitanism*, *opinion leadership*, and *climate for change* influenced fatigue guideline adoption in the hospital clinic settings, but not the office clinic settings. *Context* influenced fatigue guideline adoption in the office clinic settings, but not the hospital clinic settings.

For staff nurses, nurse characteristics (*opinion leadership*, *experience*, *education*, and *perceptions*) and the organization characteristic of *policies supporting practice* accounted for 15.4% of the variance in pain guideline adoption ( $F_{5,296}= 11.963, p<.001$ ). As seen in Table 16, *policies supporting practice* had the most influence on staff nurses' adoption of pain guidelines. For APNs, nurse characteristics (*cosmopolitanism* and *perceptions*) and the organization characteristic of *policies supporting practice* accounted for 21.1% of the variance in pain guideline adoption ( $F_{3,103}=10.466, p<.001$ ). *Policies supporting practice* and *perceptions* had the most influence on the APNs' adoption of pain guidelines. These results indicate that, with the exception of *perceptions* and *policies supporting practice*, characteristics that influence pain guideline adoption are different for staff nurses and APNs.

For staff nurses, nurse characteristics (*cosmopolitaness*, *experience*, *education*, and *perceptions*) and organization characteristics (*climate for change* and *policies supporting practice*) accounted for 17.5% of the variance in fatigue guideline adoption ( $F_{6,283}=11.206, p<.001$ ). As seen in Table 16, *policies supporting practice* had the strongest influence on staff nurses' adoption of fatigue guidelines. For APNs, nurse characteristics (*cosmopolitaness* and *perceptions*) and the organization characteristic of *policies supporting practice* accounted for 39.5% of the variance in fatigue guideline adoption ( $F_{3,103}=24.095, p<.001$ ). All three of these variables exerted strong influence on APNs' adoption of fatigue guidelines. These results indicate that there are more influential characteristics for the staff nurses than the APNs. The characteristics that influenced the APNs' fatigue guideline adoption also influenced the staff nurses' adoption, with *policies supporting practice* exerting the strongest influence on both the staff nurses and the APNs.

### Discussion

Results from this study indicate that nurse characteristics and perceptions of the guideline and organizational characteristics have a key role in outpatient oncology nurse adoption of evidence-based practice guidelines related to symptom management. Experienced and more highly educated nurses were more likely to adopt guidelines, were able to successfully share this knowledge, and considered that the guidelines are both needed and credible. In addition, the organizations that were more likely to have adopted pain and fatigue guidelines

possessed a positive attitude towards change and had philosophies and goals that supported guideline adoption.

As seen in Table 11, *nursing experience* ( $p<.001$ ) was higher in 2012 compared to Greene (1997). More of the current sample possessed education beyond a baccalaureate degree than did nurses in Greene's sample ( $p=.001$ ). Higher education systems strive to develop critical thinking skills in students that, along with experience, may make nurses with advanced education more likely to appreciate the evidence-based information contained in a guideline.

The amount of variance in pain guideline adoption accounted for with this study (21.4%) was similar to Greene (1997) (20%). However, the influential characteristics were different. *Context* (organizations with philosophies and goals supporting guidelines) and *policies* supporting the nursing practice predicted adoption in both studies, with *context* having a negative influence in both studies. The other variables found influential by Greene (*sources of information for problem solving, cosmopolitaness, and size*) did not significantly contribute to our model. *Opinion leadership, nursing experience, education, and climate for change* were independent predictors in the current study but were not found significant by Greene. *Perceptions* of the guidelines were found to be contributors to adoption in the current study, and had not been studied by Greene (1997).

Characteristics that influenced adoption of the pain and fatigue guidelines may relate to influences of the current economic climate on work environments and resulting practice setting transformations. Reimbursement changes and

recent financial hardships have decreased oncology nurses' employer-sponsored travel and conference expense reimbursement (ONS, 2011). *Cosmopolitaness* reflects the nurse involvement with outside contacts, such as travel and conference attendance. Thus, the decrease seen in 2012 *cosmopolitaness* scores from 1997 (Greene, 1997) may reflect this (Table 11). Interestingly, *cosmopolitaness* did not influence adoption for the pain guidelines, yet did influence adoption of the fatigue guidelines. A possible explanation for this is the emphasis by regulatory agencies on pain guideline use (Fox & Gordon, 2002) that resulted in pain guideline education within facilities. There is no such regulatory agenda for fatigue guidelines. Thus, fatigue guidelines may be more likely to be learned outside the facility by those who are more *cosmopolite*.

In the current study, more nurses worked in hospital-based clinics than did in Greene's (1997) study. This is consistent with the cost-driven trend from physician-owned practices towards hospital-owned practices (Liebhaber & Grossman, 2007; O'Malley, Bond, & Berenson, 2011). Although Donohue (manuscript in preparation) found setting did not influence guideline adoption, specific factors influencing both pain and fatigue guideline adoption differed according to outpatient setting.

*Resistance to change* had greater influence on guideline adoption in the office setting than in the hospital. In the hospital, *climate for change*, *context*, and *education of the nurse* had an influence on pain guideline adoption; these were not predictive in the office setting. Differences of *resistance to change*, *climate for change*, and *context* could logically relate to accrediting agency influences.



The Joint Commission is a regulatory agency that accredits hospitals, hospital outpatient clinics, and rarely, office clinics (Fox & Gordon, 2002). Accredited organizations are required to ensure appropriate pain assessment and medication management, and to provide patient and caregiver education, all of which is covered in the facility policies and procedures (Dahl & Gordon, 2002). As a result, programs on pain guideline compliance within the facility are mandated by the organization (*climate for change*). This mandate is confirmed with the low *voluntariness* score for pain (2.7) compared to fatigue (4.1) (Table 12). *Resistance to change* is unlikely and *climate for change* is most likely to influence guideline adoption at accredited facilities (hospital clinics). *Resistance to change* would be a determining factor in lack of adoption in nonaccredited facilities (office clinics) with private practice-ownership. The reason for negative influence of *context* cannot be determined by this study, but may be attributed to professional nurses' resistance to limitations of their autonomy imposed by administration.

Pain guideline adoption in both the office and the hospital setting were influenced by nurse characteristics of *opinion leadership* and *nursing experience*. The level of nursing education influenced pain guideline adoption in the hospital setting, yet not in the office setting, and influenced fatigue guideline adoption in both settings. Time may have been an equalizer for pain guideline adoption regardless of education level in the office setting. The World Health Organization (1986) first introduced international pain guidelines in 1984. Fatigue guidelines were not introduced until nearly a decade later (Winningham et al., 1994). Nurses

would have been exposed to the pain guidelines longer than the fatigue guidelines. Thus, it is logical that the level of education would have less influence on adoption the longer the guidelines have been in place.

While the office and hospital clinics had approximately the same proportions of staff nurses to APNs, the influential factors for adoption of the pain guidelines for the staff nurses and the APNs were different except for *policies* and *perceptions* of the guidelines. *Cosmopolitaness* was not influential for the staff nurses, yet was influential for the APNs for both pain and fatigue guideline adoption. *Opinion leadership*, *nursing experience*, and *education* were influential factors for pain guideline adoption with staff nurses, but not APNs. Rationale for these differences may be linked to the education and required core competencies for the APNs of a higher degree, and higher levels of *opinion leadership* and *nursing experience* (Cooke, Gemmill, & Grant, 2008).

The influencing factors for both pain and fatigue guideline adoption were the same for the APN. The staff nurses had the same influencing factors for fatigue guideline adoption as with pain guideline adoption with the addition of *cosmopolitaness* with fatigue guideline adoption. *Cosmopolitaness* influenced pain guideline adoption for the APNs but not the staff nurses, and influenced both staff nurses' and APNs' fatigue guideline adoption.

Advanced Practice Nurses are more likely to be in positions of authority, or at least able to influence policies and procedures in their facilities. Therefore, APNs who are more *cosmopolite* could be more innovative. Adoption occurs more quickly with authority decisions than optional decisions, dependent on how

innovative the authorities are (Rogers, 1995). Thus, *cosmopolitaness* would influence adoption for the APNs.

### Nursing Implications

Administrators need to understand that nurses with more education and experience and with the ability to influence others can positively influence guideline adoption. However, it is not realistic to expect to have only highly educated and experienced nurses at any single facility. However, nurse administrators should attempt to have experienced nurse opinion leaders, such as APNs, accessible to staff nurses. Research is needed to determine effects of incorporating different combinations of experienced nurses and APNs into clinic settings, and to measure levels of contact between the two to determine how much is needed to influence adoption.

Administrators of outpatient clinics need to appreciate the benefits to patient outcomes of nurse continuing education and networking achieved through contact outside of their immediate facility. Researchers need to develop and test the effect on adoption of innovative means of nurse exposure to outside contacts such as virtual conference attendance, journal clubs, or web-conferencing continuing education activities.

### Conclusion

Evidence-based practice guidelines for cancer-related pain and fatigue have the potential to improve cancer pain and fatigue in patients. However, oncology nurses in outpatient settings are not using these guidelines fully. This

study showed that nurses with more work experience, with higher levels of education, and who are opinion leaders can positively affect adoption if guidelines are viewed as reliable and necessary. However, success or failure of adoption cannot be attributed to nurses alone. Individuals in isolation cannot bring about adoption. Adoption means change, and change requires both individual and organizational effort. It is necessary that organizations are not only open to the possibility of change (*climate for change*), but also have a willingness to act rather than just verbalize support (*context* and *policies supporting practice*).

## References

- American Academy of Hospice and Palliative Medicine. (2007). *U.S. clinical practice guidelines for quality palliative care, The National Consensus Project 2007*. Retrieved from <http://www.aahpm.org>
- American Geriatric Society. (2009). Pharmacological management of persistent pain in older persons. *Journal of the American Geriatric Society*, 57(8), 1331-1346. doi:10.1111/j.1532-5414.2009.02376.x
- American Pain Society Quality of Care Committee. (1995). Quality improvement guidelines for the treatment of acute pain and cancer. *Journal of the American Medical Association*, 274(23), 1874-1880.
- American Society of Anesthesiologists. (1996). Practice guidelines for cancer pain management. *Anesthesiology*, 84, 1243-1257.
- Ayello, E. A., Baranoski, S., & Salati, D. S. (2005). A survey of nurses' wound care knowledge. *Advances in Skin & Wound Care*, 18(5 Pt 1), 276-278. doi:10.1097/00129334-200506000-00014
- Cooke, L., Gemmill, R., & Grant, M. (2008). APN core competencies: A framework for developing and testing an APN discharge intervention. *Clinical Nurse Specialist*, 22(5), 218-225. doi:10.1097/01.NUR.0000325366.15927.2d.
- Crane, J., Horsley, J., Stewart, B., & Shepherd, P. (1990, May). *The research utilization survey instrument*. Poster presented at the meeting of the Western Society for Research in Nursing, Denver, CO.
- Dahl, J. L., & Gordon, D. B. (2002). Joint Commission pain standards: A progress report. *American Pain Society Bulletin*, 12(6). Retrieved from <http://www.ampainsoc.org/library/bulletin/nov02/poli1.htm?print=t>
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2<sup>nd</sup> ed.). Hoboken, NJ: John Wiley & Sons.
- Donohue, R. B. *Adoption by oncology nurses of pain and fatigue guidelines*.
- Field, M. J., & Lohr, K. N. (Eds.) (1990). *Clinical practice guidelines: Directions for a new program*. Washington, DC: National Academy Press.
- Fox, C. D., & Gordon, D. B. (2002). Joint Commission pain standards: A progress report. *American Pain Society Bulletin*, 12(6). Retrieved from <http://www.ampainsoc.org/library/bulletin/nov02/poli1.htm?print=t>

- Greene, P. E. (1997). *Diffusion of innovations in cancer pain management and barriers to changing practice: A study of office practice oncology nurses* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (Publication No. AAT9812155)
- Herr, K., Coyne, P. J., Key, T., Manworren, R., McCaffery, M., Merkel, S., ... Wild, L. (2002). Pain assessment in the nonverbal patient: Position statement with clinical practice recommendations. *Pain Management Nursing*, 7(2), 44-52. doi:10.1016/j.pmn.2006.02.003
- Hollen, C. J., Hollen, C. W., & Stolte, K. (2000). Hospice and hospital oncology nurses: A comparative survey of knowledge and attitudes about cancer pain. *Oncology Nursing Forum*, 27(10), 1593-1599.
- Idell, C. S., Grant, M., & Kirk, C. (2007). Alignment of pain reassessment practices and National Comprehensive Cancer Network guidelines. *Oncology Nursing Forum*, 34(3), 661-671. doi:10.1188/07.ONF.661-671
- Jacox, A., Carr, D. B., & Payne, R. (1994). New clinical-practice guidelines for the management of pain in patients with cancer. *New England Journal of Medicine*, 330, 651-655. doi:10.1056/NEJM199403033300926
- Kirchhoff, K. T. (2004). State of the science of translational research: From demonstration projects to intervention testing. *Worldviews on Evidence-Based Nursing*, 1(1, Supplement), S6-S12. doi:10.1111/j.1524-475X.2004.04039.x
- Liebhaber, A. L., & Grossman, J. M. (2007). Physicians moving to mid-sized, single-specialty practices. *Tracking Report*, 18, 1-5. <http://www.hschange.com/CONTENT/941/941.pdf>
- Mahon, S. M., Williams, M. T., & Spies, M. A. (2000). Screening for second cancers and osteoporosis in long-term survivors. *Cancer Practice*, 8 (6), 282-290. doi:10.1046/j.1523-5394.2000.86008.x
- Martin, S., & Larson, E. (2003). Chemotherapy-handling practices of outpatient and office-based oncology nurses. *Oncology Nursing Forum*, 30, 575-581. doi:10.1188/03.ONF.575-581
- McGuire, D. B., Johnson, J., & Migliorati, C. (2006). Promulgation of guidelines for mucositis management: Educating health care professionals and patients. *Support Care Cancer*, 14, 548-557. doi:10.1007/s00520-006-0060-7

- Miaskowski, C., Cleary, J., Burney, R., Coyne, P., Finley, R., Foster, R., ... Zahbock, C. (2005). *Guideline for the management of cancer pain in adults and children* (APS Clinical Practice Guideline Series No. 3). Glenview, IL: American Pain Society (APS). doi:10.1016/pmn.2005.04.001
- Mitchell, S., Beck, S., Hood, L., Moore, K., & Tanner, E. (2007). Putting evidence into practice: Evidence-based interventions for fatigue during and following cancer and its treatment. *Clinical Journal of Oncology Nursing*, 11(1), 99-113. doi:10.1188/07.CJON.99-113
- Mock, V. (2001). Fatigue management: Evidence and guidelines for practice. *Cancer*, 92(Suppl 6), 1699-1707. doi:10.1002/1097-0142(20010915)92:6+<1699::AID-CNCR1500>3.0.CO;2-9
- Mock, V., Atkinson, A., Barsevick, A., Cella, D., Cimprich, B., Cleeland, C., & Stahl, C. (2000). NCCN practice guidelines for cancer-related fatigue. *Oncology*, 14(11A), 151-161.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. doi:10.1287/isre.2.3.192
- National Comprehensive Cancer Network. (2011, July 22). *NCCN practice guidelines in oncology -- v.2.2011*. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/PDF/pain.pdf](http://www.nccn.org/professionals/physician_gls/PDF/pain.pdf)
- O'Malley, A. S., Bond, A. M., & Berenson, R. A. (2011, August). Rising hospital employment of physicians: Better quality, higher costs? *Issue Brief*, 136, 1-4. <http://www.hschange.com/CONTENT/1230/1230.pdf>
- Oncology Nursing Society. (2008). *Evidence based practice resource area*. Retrieved from [http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines\\_pain.pdf](http://www.ons.org/outcomes/volume3/pain/pdf/Guidelines_pain.pdf)
- Oncology Nursing Society. (2010). *ONS dashboard report October 2010*. Retrieved from <http://www.ons.org/Membership/media/ons/docs/membership/dashboards/2010octoberdashboard.pdf>
- Oncology Nursing Society. (2011, April). ONS board makes changes to national conference offerings for 2012. *ONS News*. Retrieved from <http://www.ons.org/news.aspx?id=100>
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Free Press.

- Rutledge, D. N., Greene, P., Mooney, K., Nail, L. M., & Ropka, M. (1996). Use of research-based practices by oncology staff nurses. *Oncology Nursing Forum*, 23(8), 1235-1244.
- Winningham, M. L., Nail, L. M., Burke, M. B., Brophy, L., Cimprich, B., Jones, L. S., ... Piper, B. (1994). Fatigue and the cancer experience: The state of the knowledge. *Oncology Nursing Forum*, 21, 23-26.
- World Health Organization. (1986). *Cancer pain relief*. Geneva, Switzerland: World Health Organization.



Table 9

Demographics Compared with the Oncology Nursing Society and Greene (1997)

Demographic	Oncology Nursing Society <i>n</i> (%)	Greene (1997) <i>n</i> (%)	Current Study <i>n</i> (%)
Education			
Diploma/Associate	8,836 (37.1)	168 (48.0)	127 (23.9)
Bachelor	10,182 (42.7)	152 (43.4)	241 (45.3)
Masters	4,449 (18.6)	29 (8.3)	154 (28.9)
Doctoral	378 (1.6)	1 (0.3)	10 (1.9)
Outpatient Work Setting			
Physician's office	5,098 (20.8)	318 (89.6)	132 (23.4)
Hospital-based outpatient clinic	5,041 (20.6)	14 (3.9)	390 (69.3)
Other Outpatient	2,472 (10.1)	23 (6.5)	41 (7.3)
Inpatient	9,427 (38.5)	0	0
Other	2,430 (10.0)	0	0
Direct Patient Care			
Staff Nurse	13,839 (56.5)	197 (55.6)	316 (56.1)
Nurse Practitioner	1,639 (6.7)	11 (3.1)	84 (14.9)
Clinical Nurse Specialist	946 (3.9)	37 (10.5)	47 (8.4)
Other	8,604 (32.9)	109 (30.8)	116 (20.6)
Oncology Certified	19,006 (52.7)	285 (77.7)	404 (71.8)

Table 10

## Nurse and Organization Characteristics and Measurement

Characteristics	Definitions	Measurement
Change agency	Extent the nurse influences change in practice	Score of 1 question that asked extent of the nurse's responsibility for change. Answers: 1 (not at all) to 4 (a great deal)
Cosmopolitaness	The use of outside sources of knowledge	Mean (0 to $\geq 5$ ): attended conference, contacted person outside of work; traveled
Opinion leadership	The informal influence the nurse has in the work setting	Mean of 4 questions about the nurses' influence on change in others: 1 (not at all) to 4 (very often)
Nursing experience	Number of years working as a nurse	Actual number measured in years
Education	Highest nursing education level	Mean: (1) diploma, (2) associate, (3) bachelor's, (4) master's, (5) doctoral
Certification	Board certification in oncology	Certification is indicated by checking any of five oncology certifications listed
Size	Total number of nurses at the facility daily	Actual number

Table 10 Continued

Characteristics	Definitions	Measurement
Climate for change	Extent the nurse influences change in practice	Score of 1 question that asked extent of the nurse's responsibility for change. Answers: 1 (not at all) to 4 (a great deal)
Resistance to change	Organization's opposition to change	Mean of 7 statements: 1 "strongly disagree" to 6 "strongly agree"
Context	Organization philosophy and goals about the guidelines	Mean ratings for 5 statements. Possible answers ranged from 1 "strongly disagree" to 6 "strongly agree"
Sources of information	Frequency of use of 15 possible sources for clinical problem-solving	Mean of frequency of use ratings from 1 "not at all" to "very often"
Policies	Policies regarding three nursing practices for pain management, and three nursing practices for fatigue	Sum of scores questioning whether policies exist. Possible answers: (a) no, (b) I don't know if there are policies and (d) yes there are policies.

Table 11

## Scores for Organization and Nurse Characteristics

	Greene (1997)	Current Study
<b>Characteristic</b>	Score ( <i>SD</i> )	Score ( <i>SD</i> )
<b>Organization</b>		
Size	4.0 (3.4)	4.0 (1.4)
Climate for Change	3.3 (1.3)	3.5 (.8)
Resistance to Change	3.3 (1.0)	3.4 (1.0)
Context	3.8 (1.0)	4.0 (.9)
<b>Nurse</b>		
Sources of Information	2.9 (.5)	3.0 (.6)
Change Agency	2.9 (.9)	2.6 (.9)
Cosmopolitaness	3.0 (1.7)	2.2 (1.3)
Opinion Leadership	3.2 (.7)	3.4 (.7)
Nursing Experience	16.8 (8.0)	22.0 (10.5)
Oncology Nursing Experience	10.2 (5.3)	15.0 (9.0)

Table 12

Mean Scores for Perceptions of Pain and Fatigue Guidelines

Variable	Pain <i>M (SD)</i>	Fatigue <i>M (SD)</i>
Voluntariness	2.7 (1.6)	4.1 (1.5)
Relative advantage	4.8 (.9)	4.2 (1.1)
Compatibility	4.8 (.9)	4.5 (1.0)
Image	2.5 (1.2)	2.3 (1.1)
Ease of use	4.7 (.9)	4.2 (1.1)
Demonstrability	4.3 (.7)	4.1 (.9)
Visibility	3.5 (.7)	3.4 (.8)
Overall perception score	3.9 (.5)	3.9 (.6)

*Note:* scale is a 6-point Likert scale with 1 *strongly disagree* to 6 *strongly agree*;

higher score = better perception

Table 13

Regression of Nurse and Organization Characteristics on Pain Guideline Adoption

Predictor variable	Variable statistics						
	B	SE	Beta	<i>t</i>	<i>p</i>	F	<i>p</i>
Opinion Leadership	.278	.091	.129	3.056	.002	20.770	<.001
Nursing experience	.024	.006	.160	4.052	<.001		
Education	.317	.068	.186	4.651	<.001		
Climate for change	.318	.111	.161	2.876	.004		
Context	-.296	.099	-.164	-2.979	.003		
Policies supporting change	.401	.061	.267	6.542	<.001		
Perceptions	.362	.126	.116	2.879	.004		
Constant	-2.214	.630		-3.516	<.001		
$R^2=.225$ ; Adjusted $R^2=.214$							

Table 14

Regression of Nurse and Organization Characteristics on Fatigue Guideline Adoption

Predictor variable	Variable statistics					F	<i>p</i>
	B	SE	Beta	<i>t</i>	<i>p</i>		
Cosmopolitaness	.171	.048	.147	3.528	<.001	23.326	<.001
Nursing Experience	.016	.006	.113	2.799	.005		
Education	.281	.066	.172	4.268	<.001		
Climate for Change	.166	.078	.087	2.139	.033		
Policies Supporting Practice	.450	.067	.276	6.770	<.001		
Perceptions	.289	.096	.122	3.002	.003		
Constant	-2.322	.500		-4.412	<.001		
$R^2=.220$ ; Adjusted $R^2=.211$							

Regression of Nurse and Organization Characteristics on Guideline Adoption by Setting

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Table 16

Regression of Nurse and Organization Characteristics on Guideline Adoption by Role

PAIN									
Staff Nurse					Advanced Practice Nurses				
Predictor variable	Beta	<i>t</i>	<i>p</i>	Sig	Predictor variable	Beta	<i>t</i>	<i>p</i>	Sig
Opinion leadership	.171	3.158	.002	<.001	Cosmopoliteness	.194	2.202	.030	<.001
Experience	.147	2.756	.006		Policies supporting practice	.323	3.637	<.001	
Education	.145	2.702	.007		Perceptions	.233	2.657	.009	
Policies supporting practice	.262	4.850	<.001						
Perception	.096	1.783	.076						
R <sup>2</sup> =.168;Adjusted R <sup>2</sup> =.154					R <sup>2</sup> =.234;Adjusted R <sup>2</sup> =.211				
FATIGUE									
Predictor variable	Beta	<i>t</i>	<i>p</i>	Sig	Predictor variable	Beta	<i>t</i>	<i>p</i>	Sig
Cosmopoliteness	.110	1.995	.047	<.001	Cosmopoliteness	.364	4.749	<.001	<.001
Experience	.109	1.996	.047		Perceptions	.244	3.201	.002	
Education	.161	2.983	.003		Policies supporting practice	.378	4.926	<.001	
Perception	.154	2.836	.005						
Climate for change	.107	1.937	.054						
Policies supporting practice	.273	4.949	<.001						
R <sup>2</sup> =.192;Adjusted R <sup>2</sup> =.175					R <sup>2</sup> =.412;Adjusted R <sup>2</sup> =.395				

## CHAPTER 4

### COMPARISON OF WEB SURVEYS AND MAIL SURVEYS

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### Abstract

**Purpose:** To compare the effect of mode of survey administration (Web versus mail) on response rate; reliability of the Research Utilization in Nursing (RU-N), Oncology Nursing Practice Questionnaire (ONPQ), and Perceived Characteristics of Innovating (PCI); and to discuss the methodological issues involved.

**Design:** A comparative research design using Web survey and mail survey formats.

**Sample/Setting:** 8,000 Web and 100 mail survey participants randomly selected from the Oncology Nursing Society (ONS) listserv were invited to participate in the survey; 563 responded with usable data. Inclusion criteria: nurse members of ONS within the United States working in an outpatient setting in direct patient care.

**Methods:** Data collected in 2010 via a Web survey with mailed surveys for comparison.

**Findings:** Web group response was 6.8% ( $n=545$ ) and mail group response was 18.0% ( $n=18$ ) ( $p<.001$ ). Costs per eligible subject for the Web survey (\$20.51) was lower than costs for the mail survey (\$75.66) ( $p<.001$ ). Demographics of the two groups were similar except respondents in the Web group were more likely to be advanced practice nurses ( $p<.001$ ) and work in hospital clinic settings ( $p<.001$ ), and 5.0% ( $n=1,769$ ) of ONS, 12.7% ( $n=69$ ) of the Web, and 0% of the mail group were advanced oncology certified. For the majority of constructs, adequate reliabilities were obtained when the RU-N ( $\alpha =$

.73 to .91), ONPQ ( $\alpha = .68$  to  $.75$ ), and PCI ( $\alpha = .85$  to  $.94$ ) were converted from mail to Web survey format. Scores were not affected by mode of survey administration.

Conclusions: Adequate instrument reliability of the RU-N, ONPQ, and PCI can be obtained when traditional mailed surveys are converted to Web survey format. Web survey had a much lower cost per subject compared to mail survey administration and required less of the researcher's time, yet the mail survey had a better response. Because it was not possible to know the demographics of the nonresponders for both the Web and the mail survey, nonresponse bias is a concern for both modes of survey administration.

Clinical Relevance: Established and validated mail surveys can be successfully converted to Web surveys. Research is needed to evaluate the effect of incentives on Web survey response, and to develop methods to better track the demographics of the population to monitor errors that may occur if the responders and nonresponders differ.

### Introduction

Internet access has increased dramatically in recent years with an increase in overall adult use of the Internet from 47% in 2000, to 70% in 2005, and to 80% in 2012 (Rainie, 2005; Rainie, 2012). Internet use has greatly increased access to previously difficult-to-reach populations for research (Duffy, 2002). The idea of widespread inexpensive and almost instantaneous access via the Internet to populations previously accessible only with laborious, time consuming, and costly processes makes this mode of survey administration very appealing (Kypri,

Gallagher, & Cashell-Smith, 2004; Lazar & Preece, 1999; Schmidt, 1997; Stewart, 2003; Watt, 1997).

World Wide Web and email data collection methods have the potential to overcome the barriers to research that result from international boundaries. Email surveys are surveys that are imbedded directly in the email. Web surveys are located on a website that could be accessed in multiple ways such as directly through a Web address entered into an internet browser or through a Web link provided in an email. Dillman (2007) states that email surveys are simpler to administer but have limited capabilities with regards to visual stimulation and interaction, and that Web surveys can be designed to provide more dynamic interaction possibilities between the respondent and the survey such as extensive skip patterns, drop-down boxes, and pop-up instructions.

Dillman (2007) created Tailored Design (TD) to provide principles for survey research to decrease survey error with application for both mail and Web surveys. *Sampling error* (sampling only some and not all of a population) is remedied by ensuring that an adequate sample is obtained. *Coverage error* (sample used does not truly represent the population being studied) is avoided by ensuring that all of the population has an equal chance of being chosen for participation in the survey. *Measurement error* (degree that the survey statistic varies from the real value) may be avoided by constructing the Internet survey to resemble the paper survey as closely as possible. Questions and response options need to be clear, avoid unnecessary use of graphics, sound, and animation, and be consistent with design elements. *Nonresponse error* (when the

characteristics of the responders and the nonresponders are different) is the hardest survey error to address with Internet surveys because the geographic location and other demographic details are difficult to determine from Web surveys.

A meta-analysis by Shih and Fan (2008) found that Web surveys generally had an average response rate of 34% for Web surveys and 45% for mail surveys. Recent studies that sampled the Oncology Nursing Society (ONS) listserve showed a low response rate for Web surveys with this population. Nirenberg, Reame, Cato, and Larson (2010) conducted a Web survey of the ONS listserve and had a 7% overall response to the Neutropenia Oncology Nurses Survey. Gosselin, Crane-Okada, Irwin, Tringali, and Wenzel (2011) had a 4% overall response for the ONS psychosocial Web survey.

Dillman's (2007) TD principles for constructing Web surveys are strategies for questionnaire design and implementation to reduce error and increase response rate. Dillman (2007) posits that higher response rates for both mailed and Web surveys can be achieved through the use of multiple contacts and the use of incentives. Web questionnaire designs recommended by Dillman include use of questions that are similar to the paper questionnaire and restrain in the use of color, graphics, drop-down boxes, and pop-up screens. Implementation strategies include the use of multiple contacts and the use incentives for participation.

Adequate reliability has been shown for some instruments converted from paper and telephone modes of survey delivery to Web survey mode (Graham et

al., 2006; Howell, Rodzon, Kurai, & Sanchez, 2010; Riva, Teruzzi, & Anolli, 2003). However, there has previously been no reliability testing performed on Web versions of the Oncology Nursing Practice Questionnaire (ONPQ) (Rutledge, Greene, Mooney, Nail, & Ropka, 1996), Research Utilization in Nursing (RU-N) (Greene, 1997) or Perceived Characteristics of Innovating (PCI) (Moore & Benbasat, 1991) questionnaires used in the current research. The purpose of this study was to determine the effect of Web survey administration compared to mail survey administration on costs, response rates, and internal consistency reliability of the ONPQ, the RU-N, and the PCI.

### Design and Sample

A comparative research design was used to investigate Web versus mail survey administration methods. A Web survey and a mail survey were the formats used to determine the effect of mode of survey administration on internal consistency reliability of the instrument, survey response, and methodological processes.

The 2010 membership of ONS consisted of 36,066 total members (Oncology Nursing Society, 2010). There were 24,468 members with email addresses. The table provided by Dillman (2007, p. 207) was used to determine the sample size. For the current population size, to be 95% confident that the sample estimate is within five percentage points of the true population value, and assuming maximum heterogeneity (a 50/50 split) in the population, a sample size of at least 377 was needed. To obtain the necessary participants with an expected 34% response rate of the Web survey and 45% response rate of the

mail survey (Shih & Fan, 2008), a minimum of 2,000 invitations to ONS members who met inclusion criteria (worked in the United States, in direct patient care, and in the outpatient setting) was planned. Repeat email campaigns were planned to obtain the desired number of responses. An additional 100 ONS members who had both U.S. postal addresses and email addresses, and were not chosen for the Web survey, were randomly selected to participate in the mail survey. The total sample consisted of 8,000 nurses who had email addresses and an additional 100 nurses who also had mailing addresses on file with the ONS.

Each Web campaign consisted of three email contacts (pre-invitation, invitation, and reminder). The first campaign was emailed to 2,000 ONS members and resulted in 192 completed surveys. The second campaign was emailed to another set of 2,000 additional ONS members and resulted in 367 completed surveys. Anticipating that there would be a number of responses that would not be valid, a third campaign was emailed to an additional 4,000 ONS members and resulted in 185 completed surveys. After the three Web campaigns and a single mail campaign, there were a total of 744 completed Web surveys, and 36 completed mail surveys.

The Web campaigns were evaluated for the number of emails that failed, were opened, opened the survey, completed the survey, and had useable data. Of the 8,000 potential participants emailed an invitation to the Web survey, 144 emails failed (1.8%), 3,255 opened the email (40.7%), 1,329 followed the link to the electronic survey (16.6%), 745 completed the survey (9.3%), and 545 met the study criteria (6.8% response rate). The mail surveys were evaluated for the



number that was not deliverable, returned as refusal, completed, and had useable data. Of the 100 participants invited to participate in the mail survey, one survey was not deliverable, 10 returned as refusal, 36 completed the survey, and 18 met study criteria (18% response rate).

The demographics of the completed sample were similar to the ONS membership for both the Web group and the mail group. The majority of the ONS membership ( $n=14,680$ , 60%), the Web group ( $n=303$ , 55.6%), and the mail group ( $n=13$ , 72.2%) were staff nurses. The nurses were most commonly baccalaureate-prepared for the ONS members ( $n=10,521$ , 43%), the Web group ( $n=231$ , 42.4%), and the mail group ( $n=10$ , 55.6%). More of the ONS membership ( $n=1,769$ , 4.9%) and the Web group ( $n=64$ , 11.7%) held advanced certification compared to the mail group (0%). More in the Web group ( $n=380$ , 69.7%) than in the mail group ( $n=10$ , 55.6%) worked in the hospital clinic setting ( $p<.001$ ). The majority of the ONS membership ( $n=19,006$ , 52.7%), the Web group ( $n=392$ , 71.9%), and the mail group ( $n=12$ , 66.7%) were oncology certified nurses. The Web group consisted of more advanced practice nurses (APN) ( $n=129$ , 23.7%) compared to the mail group ( $n=2$ , 11.1%) ( $p<.001$ ) and the ONS membership ( $n=2,692$ , 11%). The average age of the Web group (47.9 years,  $SD=9.8$ ) and the mail group (47.2 years,  $SD=10.0$ ) was equivalent. Both the Web group (22.1 years,  $SD=10.5$ ) and the mail group (20.9 years,  $SD=11.8$ ) had similar years of experience in nursing.

### Measures

A primarily Web survey with a mail survey component was used to determine if Web survey method of delivery was equivalent to mail survey method of delivery for response, total scores on all measures, and demographic descriptors of respondents. This survey included questions to assess adoption of pain and fatigue guidelines. Included were questions about adoption of specific practices for pain and fatigue, questions to determine perception of the guidelines, and specific demographic questions. Reliability of the mail version of the three scales used in this questionnaire (RU-N, ONPQ, and PCI) was compared to the reliability of the Web version of the same three scales.

### Procedures

A self-report paper survey was developed by merging three instruments into a single questionnaire: (a) questions related to pain and fatigue extracted from the ONPQ (Rutledge et al., 1996), (b) the RU-N (Greene, 1997) with the addition of the National Comprehensive Cancer Network and the Internet in the question asking about sources of information, and (c) the PCI (Moore & Benbasat, 1991) modified to measure perceptions of using the pain and fatigue guidelines. Also included were questions to elicit specific demographic and clinical variables of the nurse, the practice, and the practice setting. Question stems were followed by either free text or multiple-choice responses. The final instrument consisted of 96 questions. This instrument was then adapted to a Web format utilizing the electronic survey system through the University of Utah Mission Based Management (MBM) following recommendations set forth by

Dillman (2007). Field tests demonstrated that both the paper and Web surveys required 20 to 30 minutes to complete.

### Survey Launch Process

Email addresses contained in a list-serve are protected from distribution to any third party by the United States government-enacted Controlling the Assault of Non-Solicited Pornography and Marketing Act of 2003 (Stone & Weil, 2003). The list-serve management agency used by the ONS interpreted the law so that any unsolicited contact of list-serve members by a third party is spam. This meant that all contacts with the potential participants for the current study could be made only through the list-serve manager with no email addresses and demographic information provided. There is no such law preventing the marketing company from providing physical addresses for mail survey administration.

ONS granted permission for both the mail and Web survey email invitations to be submitted to members of the list-serve. The list-serve management company contracted by ONS was contacted to request mailing addresses randomly chosen from ONS members with email addresses who also supplied a mailing address. These names and addresses were emailed to the investigator as requested.

The investigator requested that the marketing company submit three separate emails (pre-invitation, invitation, and reminder) on specific dates to randomly chosen ONS members meeting the inclusion criteria. Following the ONS date approval, the three emails were sent as described below. More than a

week after the third email launch, the marketing company provided a tracking report for each email launch with details on how many emails were successfully delivered, how many were opened, and how many were read through.

The three contacts for Web survey administration recommended by Dillman (2007) were followed. First a prenotice email was sent stating that in a few days, an email would be sent with a link to an important Web survey with a gift certificate provided for participation. There was an option on this, and all other email contacts, to email the researcher for removal from survey participation. An email invitation was sent 3 days following the prenotice email with an explanation of the study and a link to the Web survey. A text box was provided when the survey was entered for the participant to provide an email address to allow a \$5.00 gift certificate to be emailed to them upon survey completion. The final email was a reminder email sent 5 days after the initial invitation containing the link to the Web survey and a reminder of the gift certificate. Costs for the Web survey administration totaled \$11,180.66 or \$20.51 per eligible subject. This amount included the marketing company fees and the cost of the incentive gift certificates.

The multiple contacts used for mail survey administration recommended by Dillman (2007) were followed. A prenotice letter was mailed stating that in a few days a questionnaire would arrive for an important survey with a gift certificate provided for participation. The survey was mailed 1 week after the prenotice letter with an explanation of the study and how to return the completed survey. A \$5.00 gift certificate and a stamped return envelope were included.

There was the option to check a box and return the survey in the envelope provided to refuse participation. A reminder letter was mailed 3 weeks after the previous mailing asking the recipient to complete and return the survey in the self-addressed stamped envelope previously provided, and reminding them of the incentive gift previously sent. Costs for the mail survey administration was \$1,361.93 or \$75.66 per eligible subject. This amount included paper, envelopes, printing charges, incentive gift certificates, and postal charges. The cost per eligible subject of the Web survey (\$20.51) was substantially less than for the mail survey (\$75.66).

#### Data Handling Procedure

For the Web group, data collection occurred over 22 days for each campaign. As responses occurred, they could be viewed on the MBM website. Respondents who supplied an email address were emailed a gift certificate for an online bookstore. Upon survey completion, the researcher electronically transferred a copy of all responses from the MBM electronic survey website into an Excel file, that was then converted electronically into a SPSS for Windows (v. 20) file for analysis.

For the mail group, data collection occurred over 49 days. Two additional weeks were allowed after the final mailing for responses to be received. As the researcher received responses, the data were entered into SPSS. The same format used for the electronically submitted surveys was used.

### Data Analysis

The data were separated according to mode of survey administration (Web or mail). Adoption of pain and fatigue guidelines was determined using the composite score (range of 0 to 4) of questions designed by Greene (1997). Adoption of specific nursing practices for pain (assessment, scheduled medication, and nonpharmacologic techniques) and fatigue (assessment, exercise, and nonpharmacologic techniques) was determined using the scoring system used by Greene and by Rutledge et al. (1996). A composite score to determine adoption was obtained (range of 0 to 4) with higher scores indicating further progression in the adoption process. Interpretation for pain and fatigue guidelines adoption, and adoption of each specific practice for pain and fatigue used Brett's (1987) adoption scale. Brett's adoption scale places the adoption score at a level congruent with Rogers' (1995): aware (0 to 0.49), persuaded (0.5 to 1.49), use sometimes (2.5 to 3.49), and use always (3.5 to 4.0).

Perception of the guidelines was determined using the scoring system provided by Moore and Benbasat (1991). A score for perception of the guidelines was determined (range of 1 to 6) with higher scores indicating a more positive perception of the guideline. Because the data were not normally distributed, the effect of survey mode (Web or mail) and role (staff nurse or APN) on adoption of the pain and fatigue guidelines was evaluated with separate Mann-Whitney U Tests with significance set at .05.

## Results

Internal consistency reliability, as measured by Cronbach's alphas, for the RU-N and the ONPQ were for the most part adequate. The majority of the subscales of the current study had adequate internal consistency for the RU-N (Greene, 1997) for both the Web survey ( $\alpha = .73$  to  $.91$ ) and the mail survey ( $\alpha = .85$  to  $.94$ ) compared to Greene ( $\alpha = .82$  to  $.91$ ). The current Web survey ( $\alpha = .67$ ), mail survey ( $\alpha = .59$ ), and Greene ( $\alpha = .66$ ) had less than desirable internal consistency with the subscale of *cosmopolitaness*. The mail survey had less than desirable internal consistency with the subscale *context* ( $\alpha = .46$ ). With the ONPQ, the current study had adequate reliability for the Web survey ( $\alpha = .68$  to  $.75$ ) and the mail survey ( $\alpha = .70$  to  $.81$ ), as did Rutledge et al. (1996) ( $\alpha = .68$  to  $.95$ ).

The PCI (Moore & Benbasat, 1991) had adequate internal consistency for the majority of the constructs for perception of the pain guidelines for both the Web survey ( $\alpha = .85$  to  $.94$ ) and the mail survey ( $\alpha = .81$  to  $.98$ ). Less than desirable results were found for the construct of *result demonstrability* ( $\alpha = .78$ ) for the pain guideline Web survey, and *visibility* ( $\alpha = .75$ ) for the mail survey. The majority of constructs for perception of fatigue guidelines had good internal consistency ( $\alpha = .96$  to  $.97$ ). Two constructs with less than desirable internal consistency were *result demonstrability* ( $\alpha = .69$ ) and *visibility* ( $\alpha = .61$ ). These results were consistent with Moore and Benbasat's results of majority adequacy for most of the constructs ( $\alpha = .82$  to  $.90$ ), and less than desirable internal

consistency with *result demonstrability* ( $\alpha = .79$ ). However, rather than *visibility*, Moore and Benbasat found results of *image* ( $\alpha = .79$ ) less than desirable.

As seen in Table 17, the Mann-Whitney *U* test indicated there was no significant difference ( $p=.405$ ) in the level of adoption of the pain guidelines for the mail and the Web groups. There was no significant difference in the level of adoption between the mail and Web groups for the pain practices of assessment ( $p=.909$ ), scheduled medication ( $p=.413$ ), and nonpharmacologic techniques ( $p=.069$ ). There was no significant difference ( $p=.660$ ) in the level of adoption of the fatigue guidelines for the mail and Web groups. There was no significant difference in the level of adoption between the mail and the Web groups for the fatigue practices of assessment ( $p=.152$ ), exercise ( $p=.772$ ), and nonpharmacologic techniques ( $p=.812$ ).

As seen in Table 17, there is an adoption score and an adoption category. There were no differences by survey mode (Web or mail) in the categories of adoption for pain guideline adoption (*use sometimes*), fatigue guideline adoption (*aware*), and adoption of the specific pain and fatigue practices (*use sometimes*). There was no significant difference in perception of using the pain guideline for the mail and Web groups ( $p=.627$ ). There was no significant difference in perceptions of using the fatigue guidelines for the mail and Web groups ( $p=.658$ ).

### Discussion

Use of a Web survey costs much less than the traditional mail survey administration, yet the mail survey had a much better response. There was no change in the category of pain or fatigue guideline adoption by mode of survey



administration (Web or mail), which indicates that the differences in scores were not clinically significant. Reliability of the RU-N, ONPQ, and PCI in this survey remained adequate when converted from mail to Web format. This indicates that the meaning of the scales had not changed when converted from the mail format to the Web format.

Nonresponse bias is a concern with low response. The difficulty with most surveys is that it is usually not possible to determine nonresponse bias (Dey, 1997). However, if responders and nonresponders have similar demographic characteristics, then it can be concluded that a low response rate is not non-response bias (Dillman, 1991; Krosnick, 1999). The most common role, education level, oncology certification, and setting for both the Web and mail groups for the current study were similar to the ONS membership. However, there were differences with more nurses in the Web group having advanced education and advanced certification compared to the mail group. This indicates that there may be a difference between responders and nonresponders, and nonresponse bias may have occurred.

The response rates for this survey were disappointing for both the Web and mail surveys, with the lowest response being with the Web survey. However, previous surveys conducted through the ONS list-serve had the same mail survey response (National Patient Advocate Foundation, 2008) and the same (Nirenberg et al., 2010) or worse (Gosselin et al., 2011) Web survey response. Possible reasons for a poor survey response may be related to home versus work Internet access, survey burden, or distrust of incentives.

It was not possible to know whether it was a work or home email address that the nurses had registered with ONS. A greater number of staff nurses participated in the mail survey, which may be due to a lack of easy access to the Web. Difficulties with Web access at work have been attributed to limited access to computers due to time constraints and a low computer to nurse ratio (Gilmour, Huntington, Broadbent, Strong, & Hawkins, 2012). There were more APNs participating in the Web survey, which may be due to better access to the Web in the workplace because of their role.

The length of the survey, or amount of survey burden may have contributed to low response. However, invitees for this survey did not know the length of the survey prior to accessing it, yet only 17% of invitees accessed the survey. Although it seems counterintuitive, use of an incentive to increase response may be an explanation for the low response. Cook, Heath, and Thompson (2000) found that use of incentives seemed to correspond with low response rates and that survey length did not have an influence on response rate of Web surveys. Cook and colleagues stated that use of an incentive may have implied to the invitee that the survey was long or tedious enough to require a reward and thus discouraged participation. Although use of incentives is recommended by Dillman (2007) to increase response, more research is needed to determine if the use of incentives is as effective with Web and mail.

### Conclusions

Neither Web nor mail survey response was high enough to overcome non-response bias. There was no apparent difference in scores and reliability for the

RU-N, the ONPQ, and the PCI for Web and mail surveys. Between the two survey delivery modes, mail surveys were much more cost-efficient, yet Web surveys were less time consuming to prepare, were easier to launch, provided for much easier data aggregation, and had a broader demographic reach. Research is needed to evaluate the effect on response rate of using incentives with Web surveys versus the risk of discouraging participation.

## References

- Brett, J. L. (1987). Use of nursing practice research findings. *Nursing Research*, 36(6), 344-349.
- Cook, C., Heath, F., & Thompson, R. L. (2000). A meta-analysis of response rates in Web- or Internet-based surveys. *Educational and Psychological Measurement*, 60(6), 821-836. doi:10.1177/00131640021970934
- Dey, E. L. (1997). Working with low survey response rates: The efficacy of weighting adjustments. *Research in Higher Education*, 38, 215-227.
- Dillman, D. A. (1991). The design and administration of mail surveys. *Annual Review of Sociology*, 17, 225-249. Retrieved from <http://links.jstor.org/sici?sici=03600572%281991%2917%3C225%3ATDA AOM%3E2.0.CO%3B2-I>
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2<sup>nd</sup> ed.). Hoboken, NJ: John Wiley & Sons.
- Duffy, M. E. (2002). Methodological issues in web-based research. *Journal of Nursing Scholarship*, 34(1), 83-88.
- Gilmour, J. A., Huntington, A., Broadbent, R., Strong, A., & Hawkins, M. (2012). Nurses' use of online health information in medical wards. *Journal of Advanced Nursing*, 68(6), 1349-1358. doi:10.1111/j.1365-2648.2011.05845.x
- Gosselin, T. K., Crane-Okada, R., Irwin, M., Tringali, C., & Wenzel, J. (2011). Measuring oncology nurses' psychosocial care practices and needs: Results of an Oncology Nursing Society psychosocial survey. *Oncology Nursing Forum*, 38(6), 729-737. doi:10.1188/11.ONF.729-737
- Graham, A. L., Papandonatos, G. D., Bock, B. C., Cobb, N. K., Baskin-Sommers, A., Niaura, R., & Abrams, D. B. (2006). Internet- vs. telephone-administered questionnaires in a randomized trial of smoking cessation. *Nicotine & Tobacco Research*, 8(Supplement 1), S49-S57. doi:10.1080/14622200601045367
- Greene, P. E. (1997). *Diffusion of innovations in cancer pain management and barriers to changing practice: A study of office practice oncology nurses* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations (Publication No. AAT9812155).

- Howell, R. T., Rodzon, K. S., Kurai, M., & Sanchez, A. H. (2010). A validation of well-being and happiness surveys for administration via the Internet. *Behavior Research Methods*, 42(3), 775-784. doi:10.3758/BRM.42.3.775
- Krosnick, J. A. (1999). Survey research. *Annual Review Psychology*, 50, 537-567.
- Kypri, K., Gallagher, S. J., & Cashell-Smith, M. L. (2004). An Internet-based survey method for college student drinking research. *Drug and Alcohol Dependence*, 76, 45-53.
- Lazar, J., & Preece, J. (1999). Designing and implementing Web-based surveys. *Journal of Computer Information Systems*, 39(4), 63-67.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. doi:10.1287/isre.2.3.192
- National Patient Advocate Foundation. (2008, September). *Nurses' perceptions of oncology practice in outpatient settings in 2008: Survey of Oncology Nursing Society Members*. Retrieved from <http://www.npaf.org/global-access-project>
- Nirenberg, A., Reame, N. K., Cato, K. D., & Larson, E. L. (2010). Oncology nurses' use of National Comprehensive Cancer Network clinical practice guidelines for chemotherapy-induced and febrile neutropenia. *Oncology Nursing Forum*, 37(6), 765-773. doi:10.1188/ONF.765-773
- Oncology Nursing Society (2010). *ONS dashboard report October 2010*. Retrieved from <http://www.ons.org/Membership/media/ons/docs/membership/dashboards/2010octoberdashboard.pdf>
- Rainie, L. (2005, January). Internet: The mainstreaming of online life. Pew Internet and American Life Project. *Trends 2005 (brochure)* Retrieved from [http://www.pewinternet.org/~media/Files/Reports/2005/Internet\\_Status\\_2005.pdf.pdf](http://www.pewinternet.org/~media/Files/Reports/2005/Internet_Status_2005.pdf.pdf)
- Rainie, L. (2012, February). *By the numbers: Technology's place in our lives*. Pew Internet & American Life Project. Presentation at the Wisdom 2.0 Conference, Redwood City, CA. Retrieved from <http://www.pewinternet.org/~media/Files/Presentations/2012/Feb/2012%20%2023%2012%20%20Wisdom%20%200%20%20figures%20about%20tech%20PDF.pdf>

- Riva, G., Teruzzi, T., & Anolli, L. (2003). The use of the internet in psychological research: Comparison of online and offline questionnaires. *Cyber Psychology & Behavior*, 6(1), 73-80.  
doi:10.1089%2F109493103321167983
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Free Press.
- Rutledge, D. N., Greene, P., Mooney, K., Nail, L. M., & Ropka, M. (1996). Use of research-based practices by oncology staff nurses. *Oncology Nursing Forum*, 23(8), 1235-1244.
- Schmidt, W. (1997). World-Wide Web survey research: Benefits, potential problems, and solutions. *Behavior Research Methods, Instruments, & Computers*, 29(2), 274-279. doi:10.3758%2F03204826
- Shih, T., & Fan, X. (2008). Comparing response rates from Web and mail surveys: A meta-analysis. *Field Methods*, 20(3), 249-271.  
doi:10.1177/1525822X08317085
- Stewart, S. (2003). Casting the net: Using the Internet for survey research. *British Journal of Midwifery*, 11(9), 543-546.
- Stone, B., & Weil, D. (2003, November 24). Soaking in spam. *Newsweek*, 142, 66.
- Watt, J. (1997, June). Using the Internet for quantitative survey research. *Quirk's Marketing Research Review*. Retrieved from <http://www.quirks.com/articles/a1997/19970610.aspx?searchID=272305922&sort=6&pg=1>

Table 17

## Level of Adoption of Pain Guidelines and Practices by Mode

Pain				Fatigue			
Variable	Level (SD)	Stage	<i>p</i>	Variable	Level (SD)	Stage	<i>p</i>
Guideline				Guideline			
Mail	2.3 (1.5)	Use sometimes	.405	Mail	1.2 (1.5)	Aware	.660
Web	1.9 (1.6)	Use sometimes		Web	1.3 (1.5)	Aware	
Assessment				Assessment			
Mail	3.0 (1.1)	Use sometimes	.909	Mail	2.5 (0.9)	Use sometimes	.152
Web	3.0 (1.1)	Use sometimes		Web	2.8 (1.1)	Use sometimes	
Scheduled pain medication				Exercise			
Mail	3.4 (0.9)	Use sometimes	.413	Mail	2.8 (0.7)	Use sometimes	.772
Web	3.2 (1.1)	Use sometimes		Web	2.7 (1.2)	Use sometimes	
Nonpharmacologic techniques				Nonpharmacologic techniques			
Mail	3.1 (1.0)	Use sometimes	.069	Mail	2.4 (1.2)	Use sometimes	.812
Web	2.8 (0.9)	Use sometimes		Web	2.5 (1.1)	Use sometimes	
Perception				Perception			
Mail	4.1 (.5)		.627	Mail	4.0 (1.0)		.658
Web	3.9 (.5)			Web	3.9 (.6)		

Table 17 continued

Pain				Fatigue			
Variable	Level (SD)	Stage	<i>p</i>	Variable	Level (SD)	Stage	<i>p</i>
Perception				Perception			
Mail	4.1 (.5)		.627	Mail	4.0 (1.0)		.658
Web	3.9 (.5)			Web	3.9 (.6)		

*Note:* The possible range of level of adoption scores was 1-4; to interpret mean adoption scores, unaware = 0-0.49; aware = 0.5-1.49; persuaded = 1.5-2.49; use sometimes = 2.5-3.49; use always = 3.5-4; med = medications; nonpharm = nonpharmacologic.



## CHAPTER 5

### SUMMARY

The use of evidence-based clinical practice guidelines has the potential to improve outcomes for cancer patients. However, studies have shown that these guidelines, while widely available, are not being utilized (Ayello, Baranoski, & Salati, 2005; Chung et al., 2011; Cunningham, 2006; Greene, 1997; Hollen, Hollen, & Stolte, 2000; Jordan, Sippel, & Schmoll, 2007; Mahon, Williams, & Spies, 2000; Martin & Larson, 2003; McGuire, Johnson, & Migliorati, 2006; Reuben, 2005; Rutledge, Greene, Mooney, Nail, & Ropka, 1996). Cancer-related pain and fatigue, symptoms shown to negatively impact quality of life, are among the symptoms that have widely disseminated management guidelines (Curt, 2000; Ferrell, Rhiner, & Rivera, 1993; Given et al., 2002; Grant, Golant, Rivera, Dean, & Benjamin, 2000; Innis, Bikaunieks, Petryshen, Zellermeier, & Ciccarelli, 2004; Jacox, Carr, & Payne, 1994; Oliver, Kravitz, Kaplan, & Meyers, 2001; Sherwood, Adams-McNeill, Starck, Nieto, & Thompson, 2000). No recent studies have documented the current level of adoption by oncology nurses of practice guidelines for either of these symptoms. Therefore, the primary aims of this study were to describe the level of adoption of the pain and fatigue guidelines by outpatient oncology nurses, and to describe nurse and organization

characteristics that influence adoption of these guidelines. A secondary aim was to compare Web versus mail delivery of the study instruments. In this concluding chapter, the major findings will be summarized and discussed, limitations described, and recommendations for clinical practice and future research offered.

### Response Rate and Survey Method

The sample for this study consisted of 8,000 outpatient oncology nurses who were working in direct patient care, within the United States, and with an email address on file with the Oncology Nursing Society (ONS). The sample for the mail survey consisted of an additional 100 nurses who were not included in the initial survey and who met the same criteria, plus had a mailing address on file with the ONS. Dillman (2007, p.207) recommends using an allowance of +/- 5% sampling error, which means a minimum of sample size of 377 was needed for the current population size of 24,468. Based on the average response rate of 34% for Web surveys found in a meta-analysis by Shih and Fan (2008), an initial 2,000 invitations were planned for the first wave, with additional waves as needed until the desired sample size was obtained.

Data collection occurred over 3 months. The Web survey invitations were emailed in three waves, with each wave containing three mailings (pre-invitation, invitation, and reminder). The first wave was emailed to 2,000, the second wave to another 2,000, and the third wave to another 4,000 oncology nurses. The mail survey invitations were mailed in one wave containing three mailings (preinvitation, invitation, and reminder). The final sample ( $n=563$ ) was similar to the ONS membership except that the ONS had fewer certified nurses, fewer of

the ONS nurses worked in a hospital clinic ( $p<.001$ ), and more of the ONS nurses worked in physicians' offices ( $p<.001$ ).

The overall response rate was poor ( $n=563$ , 7%), with a lower response to the Web survey ( $n=545$ , 7%) than the mail survey ( $n=18$ , 18%). Sample demographics for the Web and the mail survey groups were similar, except for more APNs and more advanced certifications in the Web group, and more diploma prepared nurses in the mail group. There was lower monetary, human resource, and time expenditures with the Web survey, which make this mode of survey delivery very appealing. However, sampling issues such as self-selection bias, inherent to survey methodology, and the difficulty of evaluating for non-response bias indicate that Web survey mode of delivery is not without its drawbacks.

My expectation of a 34% return rate based on the meta-analysis results by Shih and Fan (2008) was unrealistically high. Although the response was disappointing, it was in keeping with other recent results when the sample was from members of the ONS (Gosselin, Crane-Okada, Irwin, Tringali, & Wenzel, 2011; Nirenberg, Reame, Cato, & Larson, 2010). The small sample size for the mail survey ( $n=18$ ) is of particular concern. However, it should be noted that the scores obtained with the mail survey were similar to that of the Web survey, indicating that the sample size was adequate.

Reliabilities for the instruments (ONPQ, RU-N, and PCI) were generally maintained, as previously reported, when traditional mail surveys were converted to Web surveys. There is concern for the meaningfulness of these results due to

the low sample size with the mail survey in this study. However, comparison to previous mail survey versions of these instruments verified that reliability was maintained even with a small response. The current Web survey reliabilities were similar to the results of Greene (1997) and Rutledge et al. (1996) for the ONPQ, Greene's results for the RU-N, and Moore and Benbasat's (1991) results for the PCI. These results indicate that the ONPQ, the RU-N, and the PCI can be successfully converted from paper format to Web format without loss of reliability using the approach delineated by Dillman (2007). Study findings indicate that the instruments remain reliable whichever mode is used for data collection; however, the real issue for future research is how to obtain an adequate and representative sample.

There is a concern for the accuracy of pain and fatigue guideline adoption scores gleaned from self-report data that exclusively relies on the truthfulness of the subjects. Research is needed that uses objective means, such as chart audits, to check the accuracy of the data that were obtained with this methodology. In addition to verifying the accuracy of the survey data, linking patient outcomes to adoption levels may be an important part of the strategy to encourage adoption.

Research could be designed to compare a nurse's adoption score to patient outcomes for pain and/or fatigue. With this design, individual outpatient oncology nurses would take the survey and have an adoption score assigned. Patients under the care of this nurse would then execute a pain/fatigue

assessment tool (brief pain/fatigue inventory). The nurse adoption scores and the patient pain/fatigue scores could then be checked for correlation.

#### Level of Adoption of the Pain and Fatigue Guidelines

Adoption of pain and/or fatigue guidelines and adoption of three specific practices recommended by these guidelines were investigated. The nurses were in the *persuaded* category of adoption for the cancer-related pain guidelines, and the *use sometimes* category of adoption for the three specific pain practices (assessment, scheduled medication, and nonpharmacologic techniques). The nurses were in the *aware* category of adoption for the cancer-related fatigue guidelines and in the *use sometimes* category of adoption for the three specific fatigue practices (assessment, exercise, and nonpharmacologic techniques). The category for adoption of the pain guidelines (*persuaded*) was significantly higher than the category of adoption for the fatigue guidelines (*aware*) ( $p < .001$ ).

Adoption of the pain guidelines improved slightly from the *aware* category found by Greene (1997) to the *persuasion* category, with no change in the category of *use sometimes* for the pain practices of assessment and nonpharmacologic management found by Greene and Rutledge et al. (1996). However, there was a decline for the practice of scheduled pain management from the category of *use always* (Greene, 1997) to *use sometimes*. This decline from adoption of the guideline recommended practice of scheduled pain medication is of particular concern, and is an area that deserves further study to verify this trend as well as to investigate the reason for this change if it persists. No previous studies were available for comparison of adoption for the fatigue

guidelines. However, there was no change in the adoption category of *use sometimes* for the practice of fatigue assessment compared to Rutledge et al. (1996).

The nurses were further on Rogers' (1995) continuum of adoption for the specific practices than for the overall guidelines of both pain and fatigue. The fact that they were only at the *aware* stage of the fatigue guidelines indicates that the nurses are not familiar enough with the fatigue guidelines to be persuaded that they are necessary. Comparison of the adoption categories for the guideline with the adoption categories for the specific practices for both pain (*persuaded* versus *use sometimes*) and fatigue (*awareness* versus *use sometimes*) indicates that the nurses are less familiar with the fatigue guidelines than the pain guidelines, yet equally familiar and using the specific practices for both pain and fatigue.

The level of adoption of the specific practices was higher than the level of adoption of the guidelines. This indicates that, even though the nurses were not familiar with the guidelines, they were sometimes using the specific practices recommended by the guideline. The National Comprehensive Cancer Network (2012) states that familiarity with pain guidelines is imperative to cancer pain management. These guidelines provide information on cancer pain pathogenesis, assessment techniques, barriers to appropriate treatment, and pertinent approaches to the treatment of pain. Ideally, the nurses would be knowledgeable about the guidelines and the practices they recommend. An area of future study could be to compare practice outcomes of nurses who are both

familiar with and utilizing the full guidelines versus those who are familiar with only the recommended practices.

This study shows that more than 70% of the respondents reported that they had learned of the pain and fatigue practices through the literature. However, these results imply that staff nurses remain unfamiliar with actual guidelines as a source for professional practice, yet they report using practices that are recommended in the guidelines. It may be that the literature is not adequately linking the guideline and the practices. Awareness of guidelines could be increased by inclusion of guideline information in educational articles on particular practices to link the evidence to the particular practices under discussion. Results of this study suggests that administrators with the responsibility for promoting evidenced-based practice in an oncology setting should know that staff nurses in particular may use a recommended practice but need assistance in utilizing the full scope of the guideline.

Interestingly, the APNs were more knowledgeable than the staff nurses about the existence of the actual guidelines, as well as the specific practices. Perhaps this is more ingrained in advanced practice education. APNs might be good role models for staff nurses and utilized in clinical settings to share this knowledge with staff nurses. All APNs are capable of working as role models and educators for their facilities. However, staff education was a traditional role for the clinical nurse specialists.

The clinical nurse specialist (CNS) is typically employed in the hospital setting, with very few CNSs working in the outpatient setting (Patten & Goudreau,

2012). In the outpatient setting, the most common APN is the nurse practitioner (Hing & Sayeedha, 2011), whose traditional role is clinician. There is currently a transformation underway in nursing education. The American Association of Colleges of Nursing (AACN) (2006) has proposed the Doctorate in Nursing Practice (DNP) as the level of education preparation required for advanced practice nursing.

The AACN (2006) adopted the position to move the current level of preparation necessary for advanced nursing practice roles from the master's degree to the doctoral level by the year 2015. The DNP is a practice-focused doctorate, in contrast to the Doctor of Philosophy degree that is research focused. The AACN states that, regardless of nursing specialty (nurse practitioners, clinical nurse specialists, nurse anesthetists, and nurse midwives), the key activities of the DNP graduates are the translation of research into practice and the dissemination and integration of new healthcare knowledge. This indicates that NPs and CNSs that have achieved the DNP level of education would be equally suited for staff education and implementation of evidence-based practice. An interesting component of future research would be to investigate the role of the DNP in the hospital versus office clinic setting and to investigate the DNP potential to improve adoption of evidenced-based standards by the entire oncology nursing staff.

From the findings of this study, it is apparent that there has been very little advancement in the stages of adoption of the pain and fatigue guidelines, although the World Health Organization (1986) published the first international



pain guidelines more than a decade before publication of the fatigue guidelines (Winningham et al., 1994). Outpatient oncology nurses appear to be adopting certain practice recommendations of the pain and fatigue guidelines without awareness of the existence of the guidelines. However, the adoption process is not complete, even for the practice recommendations. These results imply that current strategies to encourage adoption of both guidelines and specific practices are ineffective. Results of this study emphasize the need for development of new strategies to encourage adoption of pain and fatigue guidelines.

Strategies shown to be effective to encourage guideline adoption involved the use of chart audits with timely, task-oriented, and nonpunitive feedback on the effect of practices on patient outcomes (Davis et al., 1999; Hysong, Best, & Pugh, 2006). Research could be conducted in different outpatient settings, use chart audits and feedback, and incorporate different combinations of experienced nurses and APNs. A separate aspect of this research would be to measure the level of contact between the staff nurse and the APN to determine how much contact is needed to influence guideline adoption. These pain and fatigue guideline adoption results can be used as a baseline by researchers to test the effectiveness of new strategies to improve adoption.

Nurse characteristics, nurse perceptions of the guidelines, and organization characteristics influenced clinical practice guideline adoption. Setting (hospital or office) had no influence on adoption scores of the pain guidelines or the fatigue guidelines. However, there was a difference in influential characteristics according to the type of outpatient setting and the guideline

involved. *Cosmopolitaness* influenced adoption for the more recently established fatigue guidelines but not for the pain guidelines. The reason for this difference may be due to the amount of time required for the adoption process, or the lack of exposure in the hospital clinics of the nonmandated fatigue guidelines versus the mandated pain guidelines (Fox & Gordon, 2002). These results emphasize the importance of nurse perceptions of the guidelines, nurse experience and education (especially in the hospital clinic setting), and organization attitudes and policies in guideline adoption.

These results highlight the need to develop plans to promote adoption that include: (a) nurse networking opportunities outside of the workplace, particularly for adoption of more recently established clinical practice guidelines and practices; (b) use of APNs as change agents; and (c) encouragement of organization support. For office settings in particular, researchers need to develop and test the effect on adoption of different means of nurse exposure to outside contacts for continuing education activities such as virtual conference attendance, journal clubs, or Web-conferencing. The current results indicate that in the hospital clinic setting, making experienced nurse opinion leaders such as APNs accessible to staff nurses should be part of any future strategy developed to encourage guideline adoption.

This study showed that strategies to encourage adoption need to be multifocal and should integrate particular nurse and organization characteristics dependant on the practice setting. Berwick (2003) posited rules to enhance an organization's innovativeness and promote successful dissemination of

innovations such as guidelines that include: (a) have a formal system in place to search for innovations, (b) find and support individuals who search widely for innovations, and (c) support the curiosity of a few early adopters (encourage them to test evidence-based changes from the guidelines) rather than insisting always on compliance with current practices. Organizations need to provide both innovators and early adopters time and resources needed to try out new ideas.

Although the amount of variance accounted for in this study was the same as that found by Greene (1997), the influential characteristics were different. Predictors of guideline adoption for both studies relate to how the nurses received information about the pain guidelines. With the primarily office clinic setting of Greene's participants, the number of sources for problem solving and whether they used outside sources to obtain information (*cosmopolitaness*) predicted adoption, whereas, the current study participants were primarily in hospital clinic settings where pain management programs created a climate for change and a predictor for adoption in the hospital clinic setting was more related to internal providers of knowledge (APNs).

### Limitations

Several limitations must be considered in interpreting the results of these analyses. First, although the ONS is the largest oncology nursing organization, the membership does not include all the oncology nurses in the United States. The inclusion criteria that required an email address further limited the sample. This may limit the generalizability of these results.

Another limitation was the low response rate ( $n=563$ , 7%). Although the response was disappointing, it was in keeping with other recent results where the sample was from members of the ONS listserve (Gosselin et al., 2011; Nirenberg et al., 2010). The small sample size for the mail survey ( $n=18$ ) is of particular concern. However, it should be noted that the scores obtained with the mail survey were similar to that of the Web survey, indicating that the sample size was adequate. Nevertheless, improved research strategies are needed to ensure representative samples in conducting surveys with oncology nurses.

Another limitation relates to the evaluation of factors accounting for the variance in guideline adoption. This study accounted for approximately 21% of the variance for guideline adoption. Although this is considered an adequate amount of variance to have identified, other contributing factors need to be considered. This study measured many of the communication behavior characteristics of an early adopter identified by Rogers (2003) (cosmopolitaness, contact with change agents, exposure to mass media, information seekers, opinion leadership), and some of the socioeconomic characteristics of an early adopter (years of education and experience, and size of workplace). However, Rogers identified other socioeconomic characteristics (social status and upward social mobility) and personality characteristics (degree of empathy, attachment to a belief system, ability to deal with abstractions, and rationality) that were not evaluated with this instrument. It is possible that an instrument developed to include these additional variables could account for more of the variability in guideline adoption.

While acknowledging how these limitations may have affected the interpretation of the results, this study gives a current baseline for adoption level for pain and fatigue guidelines, and validates the influencing factors identified by Rogers (2003). This study is the first to test the reliability of three Web questionnaires (ONPQ, RU-N, and PCI) that had previously been shown to be reliable in the paper survey mode of administration.

### Recommendations for Clinical Practice

Recommendations to encourage adoption of practice guidelines include the need for implementation strategies that are multifaceted and occur at both the organizational and individual nurse levels. It is recommended that organizations develop policies and procedures that support and recognize use of the guidelines as well as specific practices. It is recommended that oncology nurses be provided opportunities for networking outside of their facilities, particularly when adoption of a more recent clinical practice guideline is desired. It is recommended that APNs be used as change agents for successful guideline adoption.

### Recommendations for Future Research

The results of this study suggest a number of implications for future research. As an initial step, replication of this study with a larger mail survey sample is recommended. This study emphasized that researchers need to conduct a baseline assessment of adoption levels and influential characteristics prior to planning strategies to influence adoption of guidelines or practices.

Research recommendations have been described throughout this summary that fit concisely into three statements. The first is that studies are needed to determine means to obtain an adequate and representative sample with survey research, such as with and without the use of incentives, use of differing numbers of contacts, and different sampling strategies.

The second research recommendation is that objective means, such as chart audits, should be used to check the accuracy of the data that are obtained with self-report survey methodology and to link patient outcomes to the pain and/or fatigue adoption levels. An interesting component of this study could be to develop and test the effect of different means of nurse exposure to outside contacts for continuing education activities such as virtual conference attendance, journal clubs, or Web-conferencing have on guideline adoption.

The final research recommendation is to design a study to investigate strategies to encourage use of pain and fatigue guidelines and practices. These strategies need to be unique for the staff nurses and the APNs, but both should be included in any planned intervention. A component of this interventional research is to investigate the dynamics of the staff nurse and APN relationship and adoption of pain/fatigue guidelines and practices. This study would use different combinations of experienced nurses and APNs. Measures would include the level of contact between the staff nurse and the APN needed to influence guideline adoption.

### Summary

In summary, these study results permit conclusions on conversion of surveys from paper to Web format, adoption of pain and fatigue guidelines, and characteristics that influence adoption. This study showed that traditional paper surveys could be successfully converted to Web survey format without loss of reliability. Results of this study indicate that the outpatient oncology nurses are very early in the process of guideline recognition and adoption for pain and fatigue guidelines, yet were using the practices recommended by the guidelines. Indeed the level of adoption had changed very little since previous studies 15 years ago in spite of the growing availability of guidelines and the emphasis on guideline use in both oncology medical and nursing practice.

This study confirmed that influential factors identified by Rogers (1995) continue to exert influence on adoption. However, there have been significant changes in the nurse and organization factors that influence guideline adoption compared to studies more than a decade earlier. This emphasizes the importance of determining the current influential factors prior to planning of strategies to promote adoption. This study revealed that the APN has an important role as the change agent with successful strategies for guideline adoption, especially in the hospital clinic setting. These results point out the importance of oncology nurse networking outside of the workplace to gain knowledge and encourage guideline adoption, especially of more recently established clinical practice guidelines. These results emphasize that guideline adoption does not occur in isolation. In addition to involvement of the nurses,

successful strategies for guideline adoption need to garner organizational support in both the inpatient and outpatient settings.



## References

- American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice*. Washington, D.C. Retrieved from <http://www.aacn.nche.edu/publications/position/DNPEssentials.pdf>
- Ayello, E. A., Baranoski, S., & Salati, D. S. (2005). A survey of nurses' wound care knowledge. *Advances in Skin & Wound Care*, 18(5 Pt 1), 276-278. doi:org/10.1097%2F00129334-200506000-00014
- Berwick, D. M. (2003). Disseminating innovations in health care. *Journal of the American Medical Association*, 289(15), 1969-1975. doi:10.1001/jama.289.15.1969
- Chung, S. K., Ahn, M. J., Yoo, J. Y., Choi, M., Hyang, N., Woo, S. R., ... Oh, E. G. (2011). Implementation of best practice for chemotherapy-induced nausea and vomiting in an acute care setting. *International Journal of Evidence-Based Healthcare*, 9, 32–38. doi: 10.1111/j.1744-1609.2010.00198.x
- Cunningham, R. S. (2006). Clinical practice guideline use by oncology advanced practice nurses. *Applied Nursing Research*, 19, 126-133. doi:org/10.1016%2Fj.apnr.2005.06.003
- Curt, G.A. (2000). The impact of fatigue on patients with cancer: Overview of FATIGUE 1 and 2. *The Oncologist*, 5(Suppl 2), 9-12. doi.org/10.1634%2Ftheoncologist.5-suppl\_2-9
- Davis, D., Thomson, M. A., Freemantle, N., Wolf, F. M., Mazmanian, P., & Taylor-Vaisey, A. (1999). Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *Journal of American Medical Association*, 282(9), 867-874. doi:10.1001/jama.282.9.867
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2<sup>nd</sup> ed.). Hoboken, NJ: John Wiley & Sons.
- Ferrell, B. R., Rhiner, M., & Rivera, L. M. (1993). Empowering patients to control pain. In S. Hubbard & P. Greene (Eds.), *Current issues in cancer nursing practice* (pp. 1-9). Philadelphia, PA: Lippincott.
- Fox, C. D., & Gordon, D. B. (2002). Joint Commission pain standards: A progress report. *American Pain Society Bulletin*, 12(6). Retrieved from <http://www.ampainsoc.org/library/bulletin/nov02/poli1.htm?print=t>

- Given, B., Given, C. W., McCorkle, R., Kozachik, S.K., Cimprich, B., Rahbar, M. H., & Wojcik, C. (2002). Pain and fatigue management: Results of a nursing randomized clinical trial. *Oncology Nursing Forum* 29(6), 949-956. doi:10.1188/02.ONF.949-956
- Gosselin, T. K, Crane-Okada, R., Irwin, M., Tringali, C., & Wenzel, J. (2011). Measuring oncology nurses' psychosocial care practices and needs: Results of an Oncology Nursing Society psychosocial survey. *Oncology Nursing Forum*, 38(6), 729-237. doi:10.1188/11.ONF.729-737
- Grant, M., Golant, M., Rivera, L., Dean, G., & Benjamin, H. (2000). Developing a community program on cancer pain and fatigue. *Cancer Practice*, 8(4), 187-194. doi:10.1046/j.1523-5394.2000.84012.x
- Greene, P. E. (1997). *Diffusion of innovations in cancer pain management and barriers to changing practice: A study of office practice oncology nurses* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations (Publication No. AAT9812155).
- Hing, E., & Sayeedha U. (2011, November). *Physician assistant and advanced practice nurse care in hospital outpatient departments: United States, 2008-2009*. (NCHS Data Brief No. 77). Retrieved from U.S. Department of Health and Human Services Centers for Disease Control and Prevention website: <http://www.cdc.gov/nchs/data/databriefs/db77.pdf>
- Hollen, C. J., Hollen, C. W., & Stolte, K. (2000). Hospice and hospital oncology nurses: A comparative survey of knowledge and attitudes about cancer pain. *Oncology Nursing Forum*, 27(10), 1593-1599.
- Hysong, S. J., Best, R. G., & Pugh, J. A. (2006). Audit and feedback and clinical practice guideline adherence: Making feedback actionable. *Implementation Science*, 1(9). doi:10.1186/1748-5908-1-9
- Innis, J., Bikaunieks, N., Petryshen, P., Zellermyer, & V., Ciccarelli, L. (2004). Patient satisfaction and pain management: An educational approach. *Journal of Nursing Care Quality*, 19(4), 322-327. doi:org/10.1097%2F00001786-200410000-00006
- Jacox, A., Carr, D. B., & Payne, R. (1994). New clinical-practice guidelines for the management of pain in patients with cancer. *New England Journal of Medicine*, 330, 651-655. doi:org/10.1056%2FNEJM199403033300926
- Jordan, K., Sippel, C., & Schmoll, H. (2007). Guidelines for antiemetic treatment of chemotherapy-induced nausea and vomiting: Past, present, and future recommendations. *The Oncologist*, 12(9), 1143-1150. doi:101634/theoncologist.12-9-1143

- Mahon, S. M., Williams, M. T., & Spies, M. A. (2000). Screening for second cancers and osteoporosis in long-term survivors. *Cancer Practice*, 8(6), 282-290. doi:10.1046/j.1523-5394.2000.86008.x
- Martin, S., & Larson, E. (2003). Chemotherapy-handling practices of outpatient and office based oncology nurses. *Oncology Nursing Forum*, 30(4), 575-581. doi:10.1188/03.ONF.575-581
- McGuire, D. B., Johnson, J., & Migliorati, C. (2006). Promulgation of guidelines for mucositis management: Educating health care professionals and patients. *Support Care Cancer*, 14, 548-557. doi:10.1007/s00520-006-0060-7
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. doi:org/10.1287%2Fisre.2.3.192
- National Comprehensive Cancer Network. (2012). *NCCN practice guidelines in oncology* – v.1.2012. Retrieved from [http://www.nccn.org/professionals/physician\\_gls/pdf/pain.pdf](http://www.nccn.org/professionals/physician_gls/pdf/pain.pdf)
- Nirenberg, A., Reame, N. K., Cato, K. D., & Larson, E. L. (2010). Oncology nurses' use of National Comprehensive Cancer Network clinical practice guidelines for chemotherapy-induced and febrile neutropenia. *Oncology Nursing Forum*, 37(6), 765-773. doi:10.1188%2F0.ONF.765-773
- Oliver, J. W., Kravitz, R. L., Kaplan, S. H., & Meyers, F. J. (2001). Individualized patient education and coaching to improve pain control among cancer outpatients. *Journal of Clinical Oncology*, 19(7), 2206-2212.
- Patten, S., & Goudreau, K. A. (2012). The bright future for clinical nurse specialist practice. *The Nursing Clinics of North America*, 47(2), 193-202. doi:10.1016/j.cnur.2012.02.009
- Reuben, S. H. (2005). *Translating research into cancer care: Delivering on the promise*. Bethesda, MD: U. S. Department of Health and Human Services, National Cancer Institute.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: Free Press.
- Rogers, E. M. (2003). *Diffusion of innovations* (5<sup>th</sup> ed.). New York, NY: Free Press.

- Rutledge, D. N., Greene, P., Mooney, K., Nail, L. M., & Ropka, M. (1996). Use of research-based practices by oncology staff nurses. *Oncology Nursing Forum*, 23(8), 1235-1244.
- Sherwood, G. D., Adams-McNeill, J., Starck, P. L., Nieto, B., & Thompson, C. J. (2000). Qualitative assessment of hospitalized patients' satisfaction with pain management. *Research in Nursing & Health*, 23(6), 486-495. doi:10.1002/1098-240X(200012)23:6<486::AID-NUR7>3.3.CO;2-X
- Shih, T., & Fan, X. (2008). Comparing response rates from Web and mail surveys: A meta-analysis. *Field Methods*, 20(3), 249-271. doi:10.1177/1525822X08317085
- Winningham, M. L., Nail, L. M., Burke, M. B., Brophy, L., Cimprich, B., Jones, ... Piper, B. (1994). Fatigue and the cancer experience: The state of the knowledge. *Oncology Nursing Forum*, 21, 23-26.
- World Health Organization. (1986). *Cancer pain relief*. Geneva, Switzerland: World Health Organization.

## APPENDIX A

### STUDY MEASURES

### YOUR PRACTICE SETTING

1. In what type of setting do you work? (CHECK ONLY ONE)
  - ☐ 1. Physician's office
  - ☐ 2. Hospital-based out-patient clinic
  - ☐ 3. Inpatient/Acute Care Facility
  - ☐ 4. Not currently practicing
  - ☐ 5. Other: \_\_\_\_\_
  
2. What best describes your role in the practice? (CHECK ONLY ONE)
  - ☐ 1. Staff nurse
  - ☐ 2. Clinical Nurse Specialist
  - ☐ 3. Nurse Manager
  - ☐ 4. Nurse Practitioner
  - ☐ 5. Other: \_\_\_\_\_
  
3. On average, how many hours do you work per week?  
\_\_\_\_\_
  
4. What percentage of your time is spent in direct patient care?  
\_\_\_\_\_
  
5. How many health care professionals (e.g. nurses, nurse practitioners, physicians assistants, MDs, etc.) work in your office?  
\_\_\_\_\_
  
6. How many of the following work in your office on an average day?
 

	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>≥5</b>
1. Nurse(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Nurse Practitioner(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Physician Assistant(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Physician(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
  
7. What percentage of your patients has cancer?  
\_\_\_\_\_ Percent

**CANCER-RELATED PAIN**

8. What percentage of your cancer patients have moderate to severe pain?  
\_\_\_\_\_
9. In your opinion, how significant a problem is unrelieved pain for the cancer patients in your practice? (CHECK ONLY ONE)
- ☐ 1. Not at all significant
  - ☐ 2. Somewhat significant
  - ☐ 3. Fairly significant
  - ☐ 4. Very significant
10. In your opinion, how important is it to improve pain management for your patients with cancer? (CHECK ONLY ONE)
- ☐ 1. Not at all important
  - ☐ 2. Somewhat important
  - ☐ 3. Fairly important
  - ☐ 4. Very important

## CANCER PAIN MANAGEMENT

Cancer-related pain is acute, chronic or intermittent pain related to cancer or its treatment (Oncology Nursing Society, 2008). I am conducting this survey to learn how you manage your cancer patients' pain, and what management strategies you find useful. Your answers will help with the development of ways to improve cancer pain management in the oncology office practice setting.

Thank you for your help!

11. Which of the following statements best describes your awareness of a pain management guideline before you received this questionnaire (CHECK ONLY ONE)

- ☐ 1. I had not heard or read about any pain management guideline
- ☐ 2. I knew about pain management guideline(s) but did not know what it covered
- ☐ 3. I knew about practice recommendations covered in the pain guideline(s)
- ☐ 4. Other: \_\_\_\_\_

12. If you indicated that you had heard of pain guidelines, please indicate which of these sources(s) informed you of them (check all that apply):

- ☐ 1. I read about them in the newspaper
- ☐ 2. I heard about them on the radio
- ☐ 3. I saw a story about them on television
- ☐ 4. I heard about them at a conference
- ☐ 5. I read about them in a professional journal
- ☐ 6. I heard about them from a drug company representative
- ☐ 7. I heard about them over the internet
- ☐ 8. Other: \_\_\_\_\_

13. Have you read a copy of a pain guideline?

- ☐ 1. No
- ☐ 2. Yes



14. Please indicate if you have read each of the following guidelines (check all that apply):

- ☐ 1. American Society of Pain Medicine
- ☐ 2. American Pain Society
- ☐ 3. National Comprehensive Cancer Network (NCCN)
- ☐ 4. Oncology Nursing Society (ONS)
- ☐ 5. Agency for Healthcare Research & Quality (AHRQ)
- ☐ 6. Other \_\_\_\_\_

15. Based on what you know about the pain guidelines, have you used any of the recommendations in your practice? Which statement best describes your use of the guideline? (CHECK ONLY ONE)

- ☐ 1. I don't know enough about the pain guidelines to use them
- ☐ 2. I have not considered making any changes in my practice
- ☐ 3. I have decided to make changes, but have not actually made any yet
- ☐ 4. I have made changes in my practice that I use sometimes
- ☐ 5. I have made changes in my practice that I always use
- ☐ 6. Other: \_\_\_\_\_

16. If you have changed or decided to make changes, please indicate in which areas:

- ☐ 1. Systematic Assessment of Patients' Pain
- ☐ 2. Use of a step-by-step ladder of analgesic therapy?
- ☐ 3. Use of nonpharmacologic interventions for pain management
- ☐ 4. Changing policies in the office regarding pain management
- ☐ Other: \_\_\_\_\_

17. How good a job do you think your practice does of managing pain for cancer patients?

☐ 1. Excellent

☐ 2. Good

☐ 3. Fair

☐ 4. Poor

### NURSING PRACTICE ISSUES IN PAIN MANAGEMENT

(Adapted from the Oncology Nursing Practice Questionnaire by Rutledge et al., 1996)

I would like to learn about your experience with three pain management practice issues. Read the description of each nursing practice issue and answer the questions, based on your own experience.

#### Systematic Pain Assessment

For patients experiencing cancer pain or cancer treatment-related pain, systematic (scheduled and documented with an objective rating scale) assessments of the patient's self report of pain may lead to more effective pain control than other means of monitoring.

18. Please indicate No or Yes to the questions below:

	No	Yes
A. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing systematic pain assessment?	<input type="checkbox"/>	<input type="checkbox"/>
B. Have you heard systematic pain assessment described at in-service or other professional conferences?	<input type="checkbox"/>	<input type="checkbox"/>
C. Do you have any other sources of information about systematic pain assessment?	<input type="checkbox"/>	<input type="checkbox"/>

19. If you indicated that you have other sources of information about systematic pain assessment, what are your other sources?

---

20. Do nurses in your office use systematic pain assessment?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

21. Should nurses perform systematic pain assessments for patients experiencing pain?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

22. Do you perform scheduled, written assessments of patients' pain?
- ☐ 1. No, never
  - ☐ 2. Yes, sometimes
  - ☐ 3. Yes, always
23. Do any policies or procedures supporting systematic pain assessment exist in your office practice?
- ☐ 1. No
  - ☐ 2. Yes
  - ☐ 3. I don't know

### Around-the Clock Medication Administration

Medications for persistent cancer-related pain should be administered around the clock, with additional “as needed” doses. Nursing measures to ensure proper administration of pain medication include patient education and evaluation of the patient’s response to pain medication.

24. Please indicate No or Yes to the questions below:

	<b>No</b>	<b>Yes</b>
A. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing around-the-clock medication administration?	<input type="checkbox"/>	<input type="checkbox"/>
B. Have you heard around-the-clock medication administration described at in-service or other professional conferences?	<input type="checkbox"/>	<input type="checkbox"/>
C. Do you have any other sources of information about around-the clock medication administration?	<input type="checkbox"/>	<input type="checkbox"/>

25. If you indicated that you have other sources of information about around-the-clock medication administration, what are you other sources?

---

26. Do nurses in your office educate patients about the importance of around-the-clock medication administration?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

27. Should nurses educate patients about the importance of around-the-clock medication and evaluate patients' response to medications?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

28. Do you educate patients about the importance of around-the-clock medication and evaluate patients' response to medications?
- ☐ 1. No, never
  - ☐ 2. Yes, sometimes
  - ☐ 3. Yes, always
29. Do any policies or procedures supporting around-the-clock medication administration exist in your office practice?
- ☐ 1. No
  - ☐ 2. Yes
  - ☐ 3. I don't know

## Nonpharmacologic Techniques for Pain Management

Nonpharmacologic pain management techniques include relaxation, guided imagery, and application of heat or cold. These techniques, used alone or in combination with pain medications, may reduce pain distress and increase comfort in patients experiencing cancer-related pain.

30. Please indicate No or Yes for the questions below:

	No	Yes
A. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing these techniques?	<input type="checkbox"/>	<input type="checkbox"/>
B. Have you heard nonpharmacologic techniques described at in-service or other professional conferences?	<input type="checkbox"/>	<input type="checkbox"/>
C. Do you have any other sources of information about nonpharmacologic techniques?	<input type="checkbox"/>	<input type="checkbox"/>

31. If you indicated that you have other sources of information about nonpharmacologic techniques for pain management, what are your other sources?

---

32. Do nurses in your office use nonpharmacologic techniques?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

33. Should nonpharmacologic techniques, used alone or in combination with analgesics, be offered routinely for patients experiencing pain?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

34. Do you offer or use nonpharmacologic techniques with patients experiencing pain?

- ☐ 1. No, never
- ☐ 2. Yes, sometimes
- ☐ 3. Yes, always

35. Do any policies or procedures supporting nonpharmacologic techniques for pain management exist in your office practice?

☐ 1. No

☐ 2. Yes

☐ 3. I don't know



[illegible]





## CANCER RELATED FATIGUE

The Oncology Nursing Society (2006) defines cancer-related fatigue as "a persistent and subjective sense of tiredness that interferes with usual functioning". Fatigue is more than diminished energy that is unrelieved by sleep, it can also be generalized weakness, lack of concentration and/or motivation, emotional lability, all of which are not due to comorbid conditions other than cancer. I am conducting this survey to learn how you manage fatigue in your cancer patients, and what management strategies you find useful. Your answers will help with the development of ways to improve cancer fatigue management in the outpatient oncology setting.

Thank you for your help!

43. What percentage of your cancer patients have moderate to severe fatigue?

\_\_\_\_\_ Percent

44. In your opinion, how significant a problem is fatigue for the cancer patients in your practice? (CHECK ONLY ONE)

- ☐ 1. Not at all significant
- ☐ 2. Somewhat significant
- ☐ 3. Fairly significant
- ☐ 4. Very significant

45. In your opinion, how important is it to improve fatigue management for your patients with cancer? (CHECK ONLY ONE)

- ☐ 1. Not at all important
- ☐ 2. Somewhat important
- ☐ 3. Fairly important
- ☐ 4. Very important

46. Please check the box next to the one statement that best describes your awareness of the fatigue guideline, before you received this questionnaire (CHECK ONLY ONE)

- ☐ 1. I had not heard or read about the fatigue guideline(s)
- ☐ 2. I knew about the fatigue guideline(s) but did not know what it covered
- ☐ 3. I knew about the practice recommendations covered in the fatigue guideline
- ☐ 4. Other: \_\_\_\_\_

47. If you had heard of the guideline, please indicate which of these source(s) is how you heard about them (Check all that apply):

- ☐ 1. I read about them in the newspaper
- ☐ 2. I heard about them on the radio
- ☐ 3. I saw a story about them on television
- ☐ 4. I heard about them at a conference
- ☐ 5. I read about them in a professional journal
- ☐ 6. I heard about them from a drug company representative
- ☐ 7. I heard about them over the internet
- ☐ 8. Other: \_\_\_\_\_

48. Have you read a copy of a fatigue guideline?

- ☐ 1. No
- ☐ 2. Yes

49. If you indicated that you have read a version of the fatigue guidelines, which version(s) have you read? (Check all that apply)

- ☐ 1 NCCN Cancer-Related Fatigue Guidelines
- ☐ 2 ONS Fatigue PEP Resources
- ☐ 3 Other: \_\_\_\_\_

50. Based on what you know about the fatigue guideline, have you used any of the recommendations in your practice? Which statement best describes your use of the guideline? (CHECK ONLY ONE)

- ☐ 1. I don't know enough about the guideline to use it in my practice
- ☐ 2. I have not considered making any changes in my practice
- ☐ 3. I have decided to make changes, but have not actually made any yet
- ☐ 4. I have made changes in my practice which I use sometimes
- ☐ 5. I have made changes in my practice which I always use
- ☐ 6. Other: \_\_\_\_\_

51. Please indicate if you have made changes or decided to make changes to the following fatigue management practices:

- ☐ 1. Screening of all patients for fatigue as a vital sign
- ☐ 2. Use of energy conservation and activity enhancement
- ☐ 3. Use of cognitive behavioral methods (need some examples) to optimize sleep quality
- ☐ 4. Use of nonpharmacological methods (education, massage, healing touch, relaxation, etc)
- ☐ 5. Changing policies in the office regarding fatigue management
- ☐ 6. Other: \_\_\_\_\_

52. How good a job do you think your practice does of managing fatigue for cancer patients?

- ☐ 1. Excellent
- ☐ 2. Good
- ☐ 3. Fair
- ☐ 4. Poor

## NURSING PRACTICE ISSUES IN FATIGUE MANAGEMENT

(Adapted from the Oncology Nursing Practice Questionnaire by Rutledge et al., 1996)

I would like to learn about your experience with three fatigue management practice issues. Read the description of each nursing practice issue and answer the questions, based on your own experience.

### Fatigue Assessment

Planned assessment of patients for cancer-related fatigue or cancer treatment-related fatigue (scheduled and documented with an objective rating scale) of the patient's self report of fatigue may lead to more effective fatigue control than may other means of monitoring.

53. Please indicate No or Yes to the questions below:

	No	Yes
1. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing fatigue assessment?	<input type="checkbox"/>	<input type="checkbox"/>
2. Have you heard fatigue assessment described at in-service or other professional conferences?	<input type="checkbox"/>	<input type="checkbox"/>
3. Do you have any other sources of information about fatigue assessment?	<input type="checkbox"/>	<input type="checkbox"/>

54. If you indicated that you have other sources of information about fatigue assessment, what are your other sources?

---

55. Do nurses in your office assess their patients for fatigue?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

56. Should nurses perform fatigue assessments for patients?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

57. Do you perform scheduled, written assessments of patients' fatigue?

- ☐ 1. No, never
- ☐ 2. Yes, sometimes
- ☐ 3. Yes, always

58. Do any policies or procedures supporting fatigue assessment exist in your office practice?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know



## Exercise to Decrease Fatigue

All patients should be encouraged to maintain as normal a level of activity as possible during cancer treatment. Activity enrichment can reduce the loss in physical performance and enhance functional ability thus reducing effort and decreasing fatigue.

59. Please respond No or Yes to the following questions:

	No	Yes
A. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing exercise for managing fatigue?	<input type="checkbox"/>	<input type="checkbox"/>
B. Have you heard exercise for fatigue management described at an in-service or other professional conference?	<input type="checkbox"/>	<input type="checkbox"/>
C. Do you have any other sources of information about exercise for fatigue management?	<input type="checkbox"/>	<input type="checkbox"/>

60. If you indicated that you have other sources of information about exercise for fatigue management, what are your other sources?

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61. Do nurses in your office educate patients about exercise for fatigue management?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

62. Should nurses educate patients about the importance of exercise for fatigue management and evaluate patients' response?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

63. Do you educate patients about the importance of exercise for fatigue management and evaluate patients' response?

- ☐ 1. No, never
- ☐ 2. Yes, sometimes
- ☐ 3. Yes, always

64. Do any policies or procedures supporting exercise for fatigue management exist in your office practice?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

### Nonpharmacologic Techniques for Fatigue Management

Nonpharmacologic fatigue management techniques include energy conservation, relaxation, massage, healing touch and optimizing sleep quality. These techniques may reduce fatigue and increase comfort in patients experiencing cancer-related fatigue.

65. Please indicate No or Yes for the following questions:

	No	Yes
1. Have you read any literature (such as journal articles, books, procedure manuals, or other written sources) discussing nonpharmacologic techniques for fatigue management?	<input type="checkbox"/>	<input type="checkbox"/>
2. Have you heard nonpharmacologic techniques for fatigue management described at in-service or other professional conferences?	<input type="checkbox"/>	<input type="checkbox"/>
3. Do you have any other sources of information about nonpharmacologic techniques for fatigue management?	<input type="checkbox"/>	<input type="checkbox"/>

66. If you indicated that you have other sources of information about nonpharmacologic techniques for fatigue management, what are your other sources?

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67. Do nurses in your office instruct patients on nonpharmacologic techniques to manage fatigue?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. I don't know

68. Should nonpharmacologic techniques, used alone or in combination, be offered routinely for patients experiencing fatigue?

- ☐ 1. No
- ☐ 2. Yes
- ☐ 3. Undecided

69. Do you offer or use nonpharmacologic techniques with patients experiencing fatigue?
- ☐ 1. No, never
  - ☐ 2. Yes, sometimes
  - ☐ 3. Yes, always
70. Do any policies or procedures supporting nonpharmacologic techniques for fatigue management exist in your office practice?
- ☐ 1. No
  - ☐ 2. Yes
  - ☐ 3. I don't know







78. To what extent have you been responsible for implementing practice changes in your practice setting? Would this change be clearer to what you want since these are office nurses, not hospital nurses?

79. Nurses use a number of sources to learn about new ideas or innovations. How many times during the last year did you do the following? Check the most appropriate box.

[illegible]



80. I would like to know about the kinds of informal influence you have in your work setting. To what extent do the following statements describe you? Check the most appropriate box.

	NOT AT ALL	RARELY	SOMETIMES	OFTEN	VERY OFTEN
A. Other nurses come to you for information or advice.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. You are able to influence others to change their nursing practice based on your ideas .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Other nurses in your work setting seek your advice before taking a stand on an issue about which there is a disagreement among the staff.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. If there were a disagreement among staff members in your work setting, other nurses would take the same stand you do because you have taken it .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

81. I would like to know about the climate for change within your organization. To what extent do the following statements describe your setting? Check the most appropriate box.

	NOT AT ALL	A LITTLE	SOMEWHAT	QUITE A BIT	A GREAT DEAL
A. There is open communication through formal channels.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. There is open communication through informal channels.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. There is administrative support and encouragement for change.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. There is colleague support and encouragement for change.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. There is a history of successful change efforts.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Members of the organization participate in decision-making.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. When an innovation is implemented, policies and procedures are developed to support the change.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[illegible]

[illegible]

84. When you have clinical practice problems, how often do you use each of the following sources to identify solutions for those problems? Check the most appropriate box for each source.

	NOT AT ALL	SELDOM	SOMETIMES	FREQUENTLY	ALWAYS
A. Nursing personnel in your office.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Other personnel (e.g., physicians) in your office.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Nursing personnel from other organizations (offices, clinics, or hospitals).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Nursing research journals (e.g. <i>Nursing Research</i> ).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Clinical journals (e.g., <i>Oncology Nursing Forum</i> , <i>Cancer Nursing</i> ).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. General nursing journals (e.g. <i>AJN</i> , <i>Nursing '96</i> ).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Textbooks.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. University nursing faculty in your community..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Clinical conferences.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Research conferences.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K. Newsletters.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L. The Oncology Nursing Society (ONS).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M. The American Cancer Society (ACS).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N. The National Comprehensive Cancer Network (NCCN).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O. The internet.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Finally, I would like to ask a few questions about you.

85. What is your age?  
\_\_\_\_\_ Years

86. What is your gender?

☐ 1. Male

☐ 2. Female.

87. How many years have you practiced as a registered nurse?  
\_\_\_\_\_ Years

88. How many years have you practiced in oncology nursing?  
\_\_\_\_\_ Years

89. Which of the following is the highest degree you currently hold?

☐ 1. Diploma

☐ 2. Associate

☐ 3. Bachelor's

☐ 4. Master's

☐ 5. Doctoral

☐ 6. Other: \_\_\_\_\_

90. What year did you achieve this degree? \_\_\_\_\_

91. Are you currently enrolled in an academic program leading to a degree?

☐ 1. No

☐ 2. Yes

92. If you indicated that you are currently in an academic program, what program are you in?

---

93. Are you certified in any of the following areas? (Check all that apply)

- ☐ 1. Oncology Certified Nurse (OCN)
- ☐ 2. Advanced Oncology Certified Nurse (AOCN)
- ☐ 3. Advanced Oncology Certified Nurse Practitioner (AOCNP)
- ☐ 4. Advanced Oncology Certified Clinical Nurse Specialist (AOCNS)
- ☐ 5. Certified Pediatric Oncology Nurse (CPON)

94. How many professional journals do you read on a regular basis? (Check only one))

- ☐ 1. None
- ☐ 2. One
- ☐ 3. Two
- ☐ 4. Three
- ☐ 5. Four
- ☐ 6. Five or more

95. Please check the box(es) next to the name(s) of the journal(s) you read on a regular basis (CHECK ALL THAT APPLY)

- ☐ 1. American Journal of Nursing
- ☐ 2. Cancer Nursing
- ☐ 3. Cancer Practice
- ☐ 4. Clinical Journal of Oncology Nursing
- ☐ 5. Journal of Nursing Scholarship
- ☐ 6. Nursing Research
- ☐ 7. ONCOLOGY Nursing Edition
- ☐ 8. Oncology Nursing Forum
- ☐ 9. Seminars in Oncology Nursing
- ☐ 10. Other: \_\_\_\_\_

96. Is there anything else you would like to tell me about the needs of office practice nurses and cancer pain or fatigue management? If so, please use this space for that purpose.



To ensure confidentiality your answers will be released only as summaries in which no individual's answers can be identified. Your name will be deleted from the mailing list and never connected to your answers in any way.

Results from the survey will be used to develop an understanding of the needs of oncology nurses related to cancer-related pain and fatigue recommendations. This study is part of an effort to learn the needs of oncology nurses for the successful implementation of cancer pain and fatigue recommendations. Your comments will be used to develop resources to help with this endeavor.

Thank you for very much for helping with this important study!

## APPENDIX B

### SURVEY SCORING

## Questions and Scoring for Adoption of Pain and Fatigue Guidelines

Question		Scoring	
Questions 11 & 46 <sup>1</sup>	a. I had not heard or read about any pain (fatigue) guideline	0	Composite score of questions 11 + 15 = pain guideline adoption 46 + 50 = fatigue guideline adoption
	b. I knew about pain (fatigue) guidelines but not what it covered	0	
	c. I knew about the practice recommendations covered in the pain (fatigue) guidelines	1	
Questions 15 & 50 <sup>1</sup>	a. I don't know enough about the pain (fatigue) guidelines to use them	0	Score range 0 to 4 Interpretation: 0 to 0.40 = unaware 0.5 to 1.49 = aware 1.5 to 2.49 = persuaded 2.5 to 3.49 = use sometimes 3.5 to 4.00 = use always
	b. I have not considered making any changes in my practice	0	
	c. I have decided to make changes, but have not actually made any yet	1	
	d. I have made changes in my practice that I use sometimes	2	
	e. I have made changes in my practice that I always use	3	

*NOTE:* For all Questions "Other", text was evaluated for score individually

<sup>1</sup>Questions 11 and 15 relate to pain guidelines; questions 46 and 50 relate to fatigue guideline

## Questions and Scoring for Adoption of Guideline Recommended Specific Practices for Cancer-Related Pain and Fatigue

Variable	Question	Scoring <sup>1</sup>
Awareness	Have you read any literature discussing _____ <sup>2</sup> ? Have you heard _____ <sup>2</sup> described at an in-service or conference? Do you have any other sources of information about _____ <sup>2</sup> ? Do nurses in your office use _____ <sup>2</sup> ?	Any Yes = 1 No to all = 0 Score range 0 to 4 Interpretation: 0 to 0.40 = unaware 0.5 to 1.49 = aware 1.5 to 2.49 = persuaded 2.5 to 3.49 = use sometimes 3.5 to 4.00 = use always
Persuasion	Should _____ <sup>2</sup> be done?	Yes = 1 No = 0
Use	Do you routinely do _____ <sup>2</sup> ?	Yes, sometimes = 1 Yes, always = 2 No, never = 0

*NOTE: If "yes" was answered for awareness, any missed answers for persuasion and implementation were scored as 0.*

<sup>1</sup>The adoption score is the sum of the scores for awareness, persuasion, and use.

<sup>2</sup>The blank represents the practice being evaluated.

### Questions and Scoring for Characteristics of the Nurse as an Adopter

Variable	Question(s)	Scoring	Range of Scores
Perceived significance of problem	Pain: 9 Fatigue: 44	Ordinal rating assigned	1 to 4 "Not at all significant" to "Very significant"
Perceived importance of improving	Pain: 10 Fatigue: 45	Ordinal rating assigned	1 to 4 "Not at all important" to "Very important"
Exposure to the guideline	Pain: 12 1-8 Fatigue: 47 1-8	Sum of yes selections	Yes/No (0-8)
Number of copies of guideline read	Pain: 14 Fatigue: 49	Ordinal rating assigned	Pain: 0 to 6 Fatigue: 0 to 3
Change agency	78	Ordinal rating assigned	1 to 4 "Not at all" to "A great deal"
Cosmopolitaness	79. A-C	Mean number of times each source is used	0 to 5
Opinion Leadership	80 A-D	Mean of 4 ratings	1 to 5 "Not at all" to "Very often"
Sources for clinical problem solving	84 A-O	Mean of frequency of use ratings of	1 to 5 "Not at all" to "Always"

Continued

Variable	Question(s)	Scoring	Range of Scores
Age	85	Measured in years	Actual number
Gender	86	Dichotomous rating	Male = 1 Female = 2
Experience in nursing	87	Measured in years	Actual number
Experience in oncology nursing	88	Measured in years	Actual number
Education	89	Ordinal rating	1 to 5 Diploma to Doctoral
Recency of education	90	Year of graduation subtracted from 2010	Actual number
Certification	93	Dichotomous rating	Yes = 1 No = 0
Number of professional journals read	94	Ordinal rating assigned	0 to $\geq 5$

### Questions and Scoring for Characteristics of the Practice Setting

Variable	Question(s)	Scoring	Range of Scores
Organizational Size	5.	Number of nurses working in the facility	Actual Number
Organization composition	6. A-D	Number value assigned	0 to $\geq 5$ A. Nurses B. NP's C. PA's D. MD's
Organization climate for change	81. A-G	Mean of ratings for 7 statements	1 to 5 "Not at all" to "A great deal"
Resistance to change	82. A-G	Mean of ratings for 7 statements	1 to 6 "Strongly Disagree" to "Strongly Agree"
Context	83. A-E	Mean of ratings for 5 statements	1 to 6 "Strongly disagree" to "Strongly agree"
Policies supporting nursing practices	CRP: 23, 29, 35 CRF: 58, 64, 70	Sum of scores for each nursing practice	0 to 3 0 = no or I don't know 1 = yes

## Demographic Characteristics and Scoring

Variables	Question(s)	Scoring
Practice Setting	1	Nominal 1 – 4 “Physician’s office” “hospital-based” “Inpatient/acute care facility” “not currently practicing” “other”
Role	2	Nominal 1 – 5 “staff nurse” “clinical nurse specialist” “nurse manager” “nurse practitioner” “other”
Hours work	3	Actual number
Time in direct pt care	4	Percentage



## APPENDIX C

### MAIL SURVEY LETTERS

## MAIL SURVEY PRE-INVITATION LETTER

(Date)

Dear Colleague,

I understand you are an oncology nurse working in the outpatient setting. I am writing to ask for your help with a very important survey. Results from this survey will be used to develop an understanding of you and your colleagues' needs related to management of cancer-related pain and fatigue. In a few days you will receive in the mail a questionnaire for this very important study.

I am writing in advance because we have found many people like to know ahead of time that they will be contacted. This study is important because results from the survey will be used to develop an understanding of you and your colleagues' needs related to management of cancer-related pain and fatigue.

Thank you for your time and consideration. A Barnes & Noble Gift card will be enclosed with the questionnaire as a token of appreciation for your help. It's only with the generous help of people like you that this research can be successful.

Sincerely,

Rebecca Donohue  
PhD Candidate  
University of Utah

## MAIL SURVEY INVITATION LETTER

(Date)

Dear Colleague,

I am writing to ask for your help with a very important survey. The purpose of this survey is to learn the needs of outpatient oncology nurses for the management of their patients' pain and fatigue. Results will be used to develop an understanding of you and your colleagues' needs related to management of these symptoms. A \$5.00 Barnes & Noble Gift card is included in this envelope as a token of appreciation for your help.

Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. When you submit your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers.

It should take approximately 20 minutes to complete the questionnaire. Participation in this study is voluntary. You can choose not to take part, not finish, or omit any question you prefer not to answer without penalty. If you prefer not to respond, please mail back the survey without completing it and your name will be removed from further contact.

If you have any questions, concerns, complaints, or if you feel you have been harmed by this research please contact me: (337) 289-8428; 1211 Coolidge Blvd., Suite 100, Lafayette, Louisiana 70503, or rbdnpaocn@aol.com.

Contact the University of Utah Institutional Review Board (IRB) if you have questions regarding your rights as a research participant, or with questions, complaints or concerns that you do not feel you can discuss with the investigator. The IRB may be reached at (801) 581-3655 or at irb@hsc.utah.edu.

By completing the questionnaire you are giving your consent to participate. Please return your completed questionnaire in the envelope included.

Thank you very much for helping with this important study.

Sincerely,

Rebecca Donohue  
PhD Candidate  
University of Utah

## MAIL SURVEY REMINDER LETTER

(Date)

Dear Colleague,

About a week ago you received an invitation to participate in a survey to learn the needs of outpatient oncology nurses for the management of their patients' pain and fatigue. A \$5.00 Barnes & Noble gift card was provided as a token of appreciation for your help. If you have already completed this survey I wish to thank you for your help. If you have not yet done so, I have provided another questionnaire that may complete the survey.

Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. Your submitted questionnaire will never be connected to your name.

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Sincerely,

Rebecca Donohue  
PhD Candidate  
University of Utah

## APPENDIX D

### WEB SURVEY LETTERS

## WEB SURVEY PRE-INVITATION LETTER

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If you have any questions, concerns, complaints, or if you feel you will be harmed by this research please contact me: (337) 289-8428; 1211 Coolidge Blvd., Suite 100, Lafayette, Louisiana 70503, or [rbdmsnfnp@aol.com](mailto:rbdmsnfnp@aol.com). If you prefer not to respond, please email me at [rbdmsnfnp@aol.com](mailto:rbdmsnfnp@aol.com) and your name will be removed from further contact.

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PhD Candidate  
University of Utah

## WEB SURVEY INVITATION LETTER

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Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. Your submitted questionnaire will never be connected to your name.

It should take approximately 20 minutes to complete the questionnaire. Participation in this study is voluntary. You can choose not to take part, not to finish, or to omit any question you prefer not to answer without penalty. If you prefer not to respond, please email me: [rbdmsnfnf@aol.com](mailto:rbdmsnfnf@aol.com) and your name will be removed from further contact.

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By accessing the questionnaire, you are giving your consent to participate in this study. Press and hold the control button on your keyboard while you **CLICK HERE** with your mouse to begin the survey.

Thank you very much for helping with this important study.

Sincerely,  
Rebecca Donohue  
PhD Candidate  
University of Utah

## WEB SURVEY REMINDER LETTER

Dear Colleague,

About a week ago you received an invitation to participate in a survey to learn the needs of outpatient oncology nurses for the management of their patients' pain and fatigue. If you have already completed this survey I wish to thank you for your help. If you have not yet done so, I hope that you may use the included link to access the survey. A \$5.00 Barnes & Noble eGift card will be provided as a token of appreciation for your help.

Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. Your submitted questionnaire will never be connected to your name.

It should take approximately 20 minutes to complete the questionnaire. Participation in this study is voluntary. You can choose not to take part, not to finish, or to omit any question you prefer not to answer without penalty. If you prefer not to respond, please email me: rbdmsnfnp@aol.com and your name will be removed from further contact.

If you have any questions, concerns, complaints, or if you feel you have been harmed by this research please contact me: (337) 289-8428; 1211 Coolidge Blvd., Suite 100, Lafayette, Louisiana 70503, or rbdmsnfnp@aol.com. You may contact the University of Utah Institutional Review Board (IRB) if you have questions regarding your rights as a research participant, or with questions, complaints or concerns that you do not feel you can discuss with the investigator. The IRB may be reached at (801) 581-3655 or at irb@hsc.utah.edu.

By accessing the questionnaire, you are giving your consent to participate. Please **CLICK HERE** with your mouse to begin the survey.

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